



ATTO Technology, Inc.

ATTO iPBridge 2600

Installation and Operation Manual

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1 ATTO iPBridge provides storage options

The ATTO iPBridge™ 2600 iSCSI to SCSI bridge offers an affordable opportunity to transform SCSI storage into network-enabled addressable devices, creating scalable solutions for an iSCSI SAN.

The iSCSI protocol allows storage devices such as hard drives, tape drives and libraries and CD jukeboxes to attach easily to Internet Protocol networks such as Gigabit Ethernet. The ATTO iPBridge supports the high throughput needs of streaming data transfers, optimizing performance and management using ATTO Technology intelligent Bridging Architecture™.

Gigabit Ethernet (GbE) is a transmission technology based on the Ethernet format and protocol used in local area networks (LANs), providing a data rate of 1 billion bits per second (one gigabit) as defined in the IEEE 802.3 standard.

The iSCSI protocol increases the capabilities and performance of storage data transmission by transmitting data over local area networks (LANs), wide area networks (WANs), or the Internet, providing location-independent data storage and retrieval to enhance current and future Storage Area Networks (SANs).

The iSCSI protocol enables complete SAN solutions based on a Gigabit Ethernet network infrastructure. iSCSI is a logical SAN alternative to direct-attached storage where simplicity, flexibility and price/performance are critical. Data may be accessed from virtually anywhere that can be reached through the Internet, eliminating physical boundaries.

iSCSI also lowers the investment cost of adding new servers to a SAN for both primary storage and backup applications.

Embedded software features

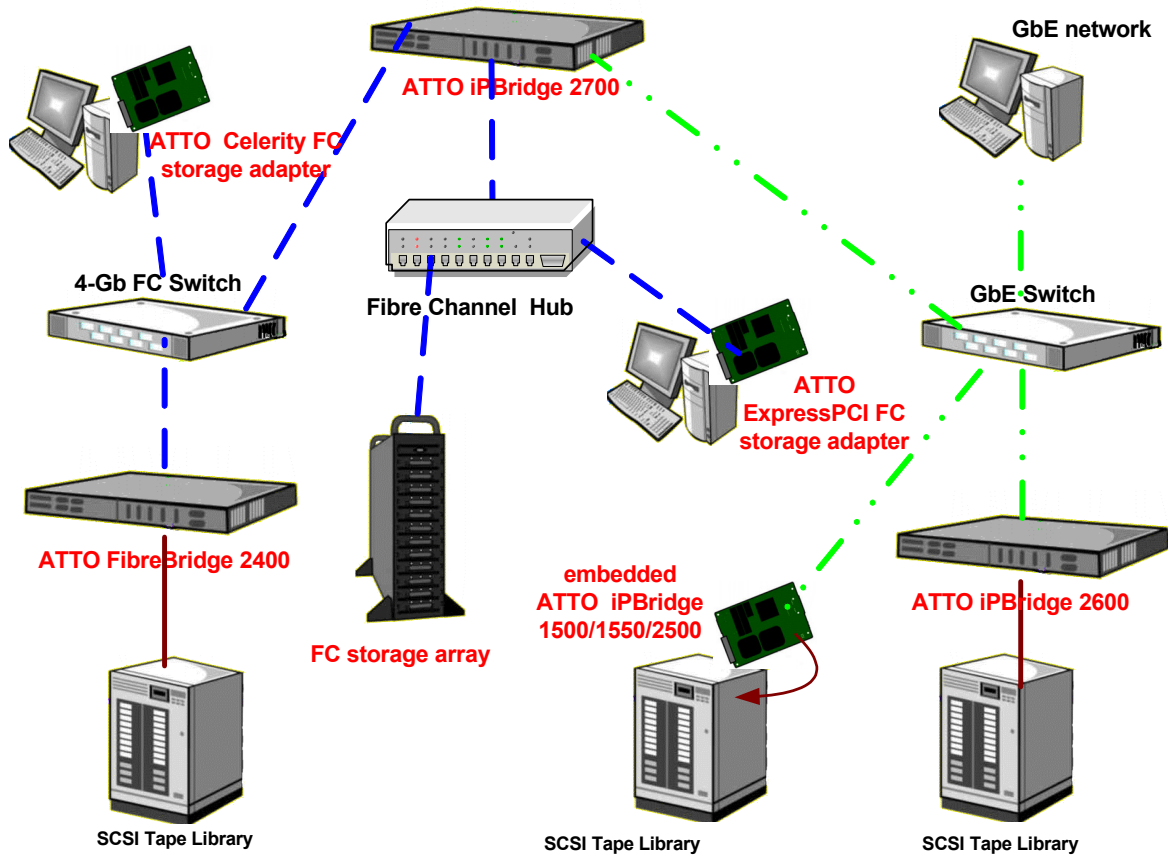
- SpeedWrite™: a performance-enhancing capability that significantly boosts Write performance by efficiently managing Write commands between host and a tape device.
- Security through Virtual LANs, Access Control Lists (ACLs) and multiple levels of password protection
- Advanced Diagnostics include software event-logging capability time and date stamped by the real time clock. You can also determine numerous status and current configuration parameters.
- Management and monitoring through ATTO ExpressNAV, a web-based management application that allows all of the configurable settings for the iPBridge to be defined, viewed and edited; E-mail notification of errors and Simple Network Management Protocol (SNMP) support.

Connectivity, infrastructure solutions

The topology of a heterogeneous Storage Area Network shown on the next page demonstrates the critical role ATTO products play in the design and implementation of a SAN. Whether your application needs are data-intensive or bandwidth intensive, you need to store and manage that data and then deliver it to end-users efficiently. ATTO products have been engineered with the highest performance and lowest cost available today.

Possible storage configurations

Ethernet
 Fibre Channel - - -
 SCSI ———



1.1 ATTO iPBridge 2600 characteristics

The ATTO iPBridge 2600 is a 1-Gigabit Ethernet to SCSI 1U full-rack bridge for high performance, cost effective solutions in enterprise environments.

The iPBridge 2600 is a cost effective, high performance bridge using four Gigabit Ethernet ports and two independent Ultra 320 SCSI busses.

Because the iPBridge 2600 provides a compact embeddable, rack or desktop solution, you can install the iPBridge in a wide range of system configurations. Uniquely designed to support the high throughput needs for applications that require streaming data transfers (data backup), the iPBridge optimizes performance by using ATTO Technology intelligent Bridging Architecture.

- 4 independent 100/1000 GbE RJ45 Ethernet ports
- Supports IP V 4
- Compliance with IEEE 802.3 GbE
- Supports Microsoft iSCSI Initiator v2.01
- Dual independent Ultra320 LVD/SE SCSI bus ports.
- Backwards compatible with all low voltage differential and single-ended SCSI devices.
- RJ-45 Ethernet management port connector
- RS-232 serial console port
- Operating System independent
- Supports all SCSI devices including hard disk drives, tape drives, RAID controllers, DVD, MO and CD libraries
- Local diagnostics support through CLI, SNMP, Telnet, FTP and SCSI Enclosure Services (SES)
- Command line and menu-based ASCII text management access via the Ethernet management port
- FCC Class A, CE EN55022, CE EN55024, CE 60950
- Available as embedded board-level or desktop/rack mount enclosure
- intelligent Bridging Architecture, the engine within ATTO iPBridge products, uses ATTO Data Routing for optimized performance

Dimensions

Width: 16.91 inches wide (42.95 cm)

Depth: 10 inches deep (25.4 cm)

Height: 1.72 inches high (4.32 cm (1U))

Weight: approximately 8 pounds

Environment

Operating temperature: Ambient air should not exceed 40°C.

Airflow: air enters through slots on the right of the rear panel and exits through slots on the left of the rear panel.

Humidity: 5-95% non-condensing

Power

Input voltage: 100-240VAC, 1.7-7A, 50-60 Hz

Battery-backed event log: A rechargeable Lithium ion battery cell holds the event log memory for up to 30 days. If the iPBridge has been disconnected from power, recharging begins automatically when power is restored to the system. The battery is fully charged after 36 hours of continuous power application.



WARNING

Risk of explosion if battery is removed and/or replaced by an incorrect type. Dispose of used batteries in accordance with your local environmental regulations.

SCSI interface

The two independent SCSI ports on the iPBridge 2600R/D connect storage devices into the Ethernet Storage Area Network (SAN). Each port is completely independent from the other.

The ports are Ultra 320 busses with 68-pin VHDCI connectors, 320 MB/sec. maximum throughput, downward compatible with all forms of low voltage differential and single-ended SCSI.

The iPBridge supports all SCSI devices including hard disk drives, tape drives, RAID controllers and DVD, MO and CD libraries.

Ethernet interface

The four independent 100/1000 Ethernet RJ45 data ports are labeled Ethernet ports 1, 2, 3 and 4. A separate 10/100 Ethernet standard RJ45 management port provides monitoring and management through telnet or ATTO ExpressNAV, a browser-based interface.

Gb Ethernet cables must be at least CAT-5E certified.

Serial interface

The RS-232 serial port provides support for remote monitoring and management through a command line interface. It is set at the factory at 115,200 bps.

Reset switch

A reset switch on the back (connector) side allows manual restart of the iPBridge using a small sharp implement inserted into the hole at the back of the iPBridge.

LED indicators

LED indicators viewed from the front of the iPBridge 2600R/D (see Exhibit 1.1-1):

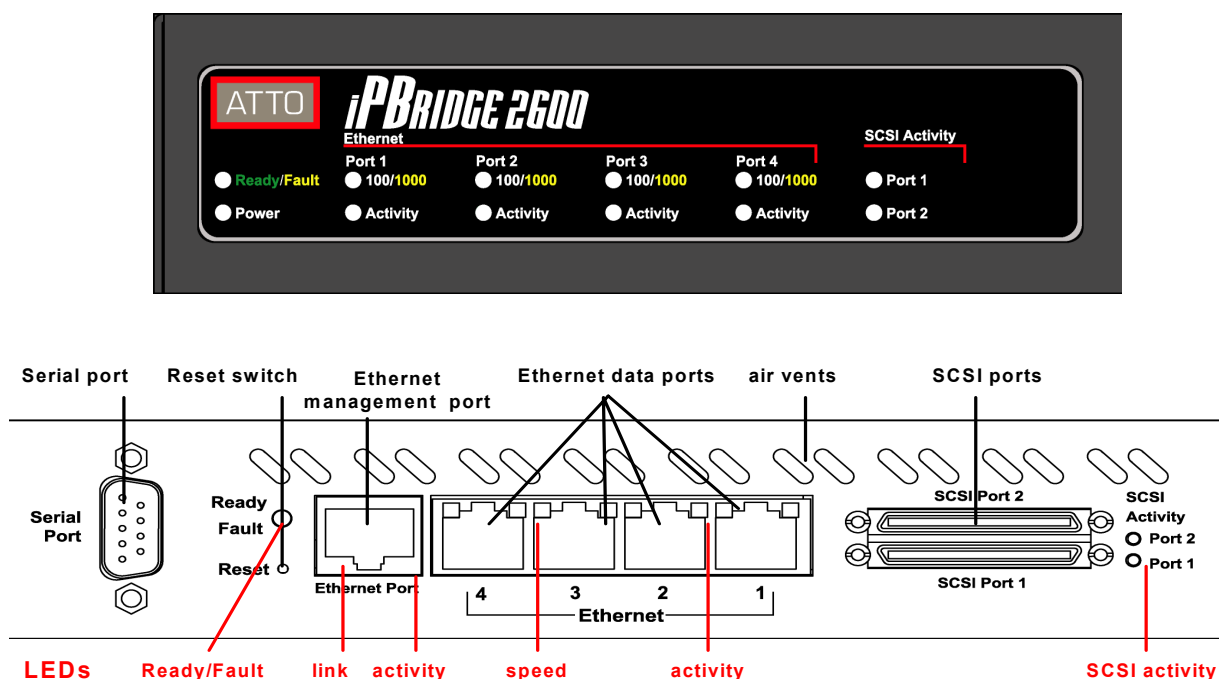
- Bicolor Ready/Fault: off means not ready; green on shows ready, and yellow on means fault
- Power: indicates power has been applied.

- Each Ethernet data port has two LEDs: when the speed LED is dark it indicates 100 Mb/sec. speed; it lights yellow for 1000 Mb/sec. speed. The activity LED lights green to represent an active link, blinks to show activity and goes dark when no link is present.
- SCSI activity is indicated for each port: lighted green means activity; off shows no activity

LED indicators viewed from the connector (back) side of the iPBridge 2600R/D (see Exhibit 1.1-1):

- Bicolor Ready/Fault: off means not ready; green on indicates ready, and yellow on shows fault
- Embedded in the RJ45 connector of the management port: green on indicates a valid link; off represents no link present
- Embedded in the RJ45 connector of the management port: blinks yellow to indicate management activity
- Embedded in the RJ45 connector of each Ethernet data port: green on indicates 100 Mb/sec. speed; yellow on indicates 1000 Mb/sec. speed
- Embedded in the RJ45 connector of each Ethernet data port: solid on represents a link is present; blinking indicates activity, and off shows no link is present
- SCSI activity is indicated for each port: on indicates activity; off shows no activity.

Exhibit 1.1-1 LED indicators on the front and connector sides of the iPBridge



2 Installing the iPBridge

If you have not already completed the instructions on the Quick Start page packed with your iPBridge, use the following instructions to install the iPBridge.

Unpack the packing box; verify contents

- The iPBridge
Note the serial number of your iPBridge, located on the bottom of the unit, for later use:

- Serial cable
- Power cord
- “L” brackets and screws
- CD which includes the Installation and Operation Manual and ATTO QuickNAV.

Place the iPBridge into your system

- 1 Place the iPBridge on a stable flat surface or install it into a standard rack.
If installing into a rack, see Exhibit 2.0-1.
 - a. Attach “L” brackets so that the front side with the LEDs face front and the connector side is at the back.
 - b. Install the iPBridge horizontally within the rack so it does not reduce the air flow within the rack.
- 2 Connect and power up SCSI target devices.
- 3 Connect the iPBridge Ethernet port to your network using at least Cat5e cable.
- 4 Connect the AC power cord from the iPBridge to the proper AC source outlet.
If you are using a rack:
 - a. Properly ground the iPBridge to the rack equipment. The earth ground connection must be maintained.
 - b. The power requirements plus the power draw of the other equipment in the rack must not overload the supply circuit and/or wiring of the rack.
- 5 Turn on the power switch on the iPBridge.
- 6 Wait up to two minutes for the iPBridge Ready LED to light indicating the bridge has completed its power-on self test sequence.

Discover the IP address

- 1 From the CD supplied with your iPBridge, run the QuickNav Utility **QuickNAV-windows.exe** for Windows or **QuickNAV-Mac** for Mac OS X.
- 2 Locate the iPBridge with the serial number recorded earlier.
- 3 Highlight the serial number.
- 4 Click **Next**.
If a DHCP server is available on your network, an address is assigned automatically by the server. Note the assigned address:

If you do not have a DHCP server, get an IP address and subnet mask from your network administrator, type it into the area provided, and select **Next**. Note the IP address and subnet mask here.

- 5 Click on **Launch Browser**

Begin initial configuration

- 1 The ExpressNAV welcome screen appears. Click on **Enter Here**
- 2 Enter the user name and password.

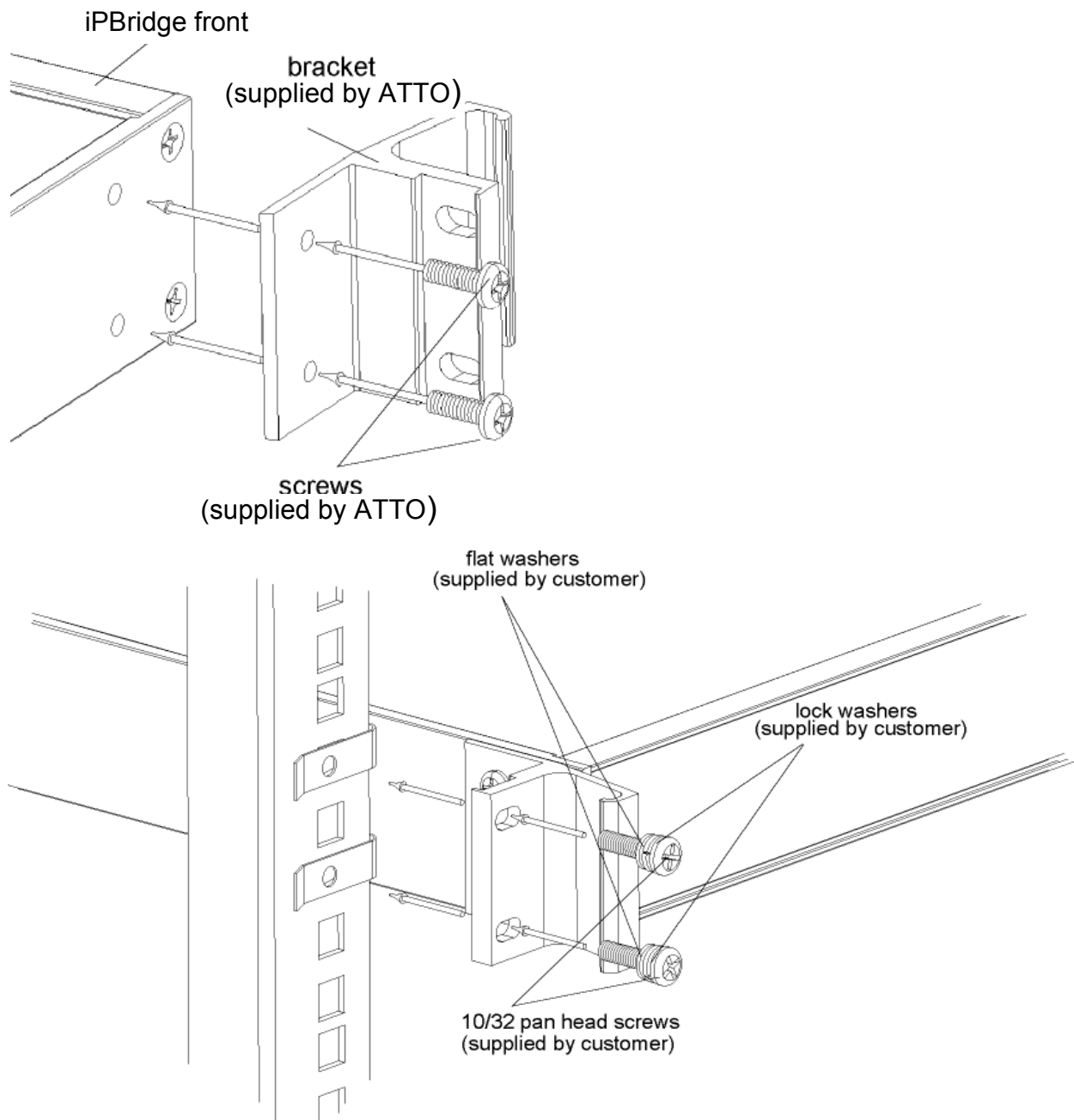


Note

The default user name is **root**; it is case insensitive. The default password is **Password**; it is case sensitive. It is best practice to change the passwords. Refer to [Additional configurations](#) on page 13.

- 3 Use the ExpressNAV browser-based interface to map devices. Refer to [ATTO ExpressNAV interface](#) on page 25 for information on ExpressNAV, and refer to [Target management](#) on page 7 for information on mapping.

Exhibit 2.0-1 Install the iPBridge into a rack using the brackets provided.



2.1 Target management

Storage devices are mapped using the designations for the iSCSI LUN. The easiest way to map devices is to use the Automatic Target Management feature in the ATTO ExpressNAV interface.



CAUTION

Changing the device map can affect the host's view of devices and your application configuration.

To map devices, you must connect the devices to one of the iPBridge SCSI ports. To access mapped devices over Ethernet, you must have a host computer connected to one of the iPBridge Ethernet data ports.

You have two options to map devices:

- 1 The default is set up as a single target node in which a host or initiator views the iPBridge as a single iSCSI node with all available devices shown as LUNs on a single iSCSI target.
- 2 You may set up multiple target nodes which allow greater flexibility to grant or deny access between initiators and devices as needed.

If you divide the default single target node into multiple target nodes, you must set up access to each node separately.

See Exhibit 2.1-1 on page 9 to see the difference between single target node and multiple target nodes.

Target names

Each iSCSI target node accessed through the Ethernet port on an iPBridge is identified by a unique world-wide iSCSI-qualified name. This format references the iPBridge serial number and target node name:

```
iqn.1995-12.com.attotech:ipbridge:  
serialnumber <targetname>
```

Default target node

The default target is set as a single target with Access Control (ACL) disabled and CHAP authentication disabled. The default target node cannot be deleted. The iPBridge maps devices automatically although you can map devices yourself.

Automatically configure a single target

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.
- 2 From the ExpressNAV main menu, click on the **Auto Target Mgt** menu item on the left side of the screen.
- 3 Click on the **Map all devices to default target** button.
- 4 When the action is complete, the **iSCSI Target Management** page appears. Make any adjustments to the mapping or begin a discovery session.

If you are prompted to restart the iPBridge, go to the **Firmware Restart** page and restart the iPBridge.

Manually configure a single target node

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.
- 2 From the ExpressNAV main menu, click on the **Manual Target Mgmt** menu item on the left side of the screen.
- 3 Click on the **Device Maps** link of the default target.
- 4 Select the devices from the box on the right hand side of the screen and drag to the appropriate LUN on the left.
- 5 Click **Submit**.
If you are prompted to restart the iPBridge, go to the **Firmware Restart** page and restart the iPBridge.

Multiple target nodes

Multiple targets allow you to create a more configurable mapping scheme which can segregate storage into different iSCSI nodes within the iPBridge, with each iSCSI target having its own set of access criteria.

For example, if you have two servers and a library with four tapes and a media changer, the default nodes would provide both servers access to all tapes and the media changer (default target mode).

If you configure multiple target nodes, you are able to map some devices to one server and other devices to the other server, requiring separate user names and passwords for access using various methods including Access Control Lists, iSNS and CHAP authentication. Consult with your network administrator and refer to Exhibit 2.1-1, [iSCSI commands](#) on page 51 and the [Glossary](#) on page v of the Appendix.



Note

If you map actual storage to more than one iSCSI target and a server has authorization for both targets, the server could show duplicate storage without any warning.

Automatically configure multiple targets

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.
- 2 From the ExpressNAV main menu, click on the **Automatic Target Management** menu item on the left side of the screen.

- 3 Click on the **Map each device to its own target** button. See Exhibit 2.1-2 on page 10. The iPBridge maps itself as a device at LUN 0. A target name suffix is added to the iqn of each device such as

vendorid-devicename-xxx

- **vendorid** is the device vendor ID
- **devicename** is the device's inquiry device name.
- **xxx** is a device index

When the action is complete, the screen returns to the **iSCSI Target Management** page.

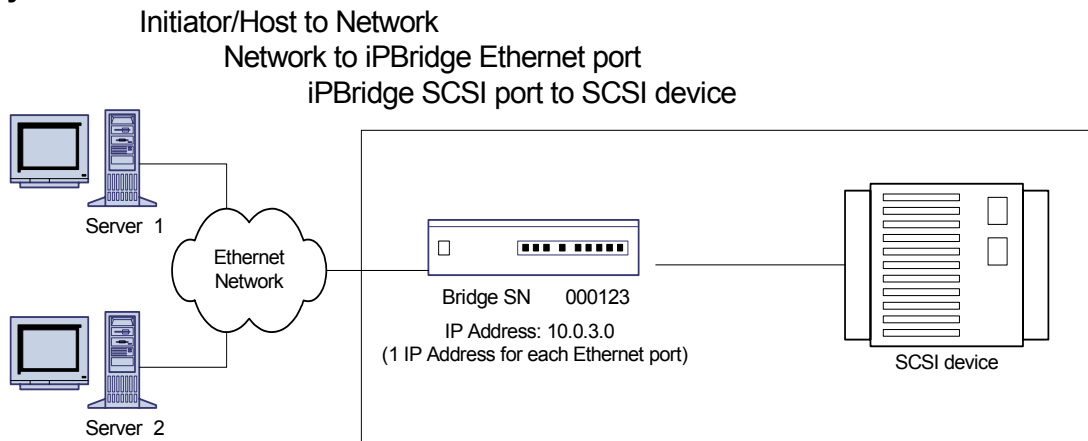
If you are prompted to restart the iPBridge, go to the **Firmware Restart** page and restart the iPBridge.

Manually configure multiple target nodes

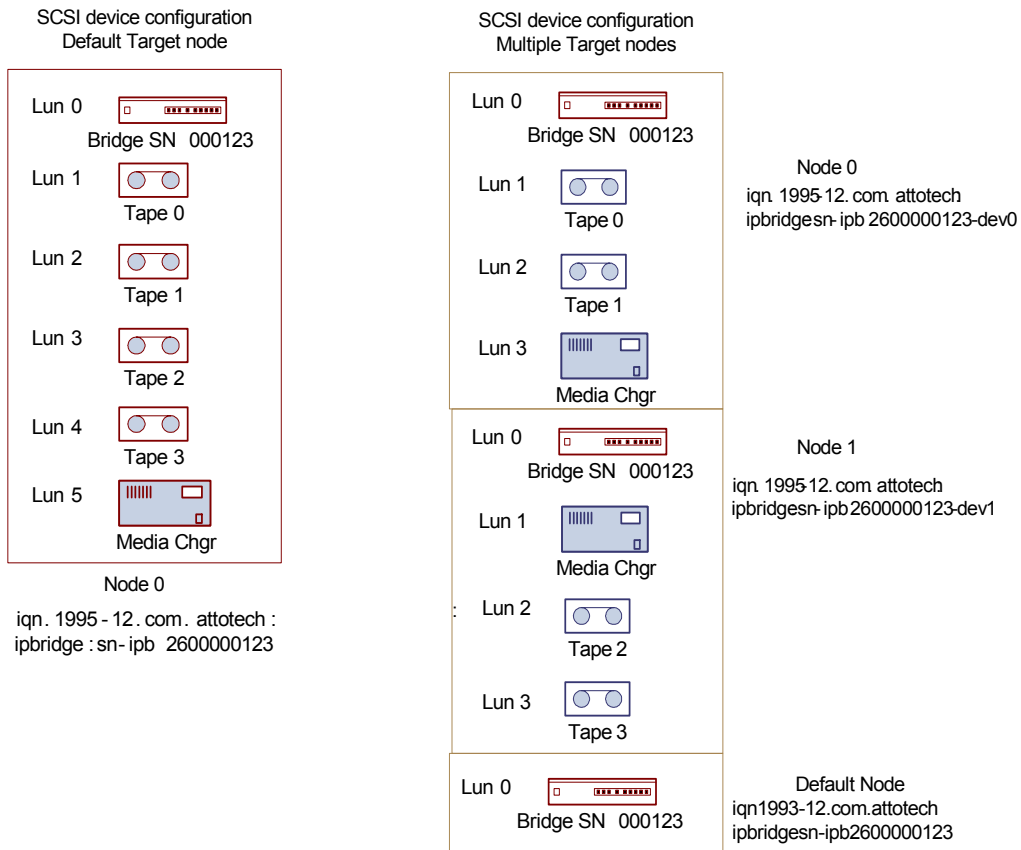
- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.
- 2 From the ExpressNAV main menu, click on the **Automatic Target Management** menu item on the left side of the screen.
- 3 In the **iSCSI Target Management** page, type **[name]** in the **Add an iSCSI target** box. The name is a suffix appended to the standard iPBridge iqname. The suffix name can be up to 24 characters.
- 4 Click on the device map link of your target.
- 5 After the next mapping page opens, drag the boxes representing devices to the LUNs you want.
- 6 Click **Submit**.
- 7 Repeat from [Step 3](#) for each node you want to configure.
- 8 If you are prompted to restart the iPBridge, go to the **Firmware Restart** page and restart the iPBridge.

Exhibit 2.1-1 Target node configurations

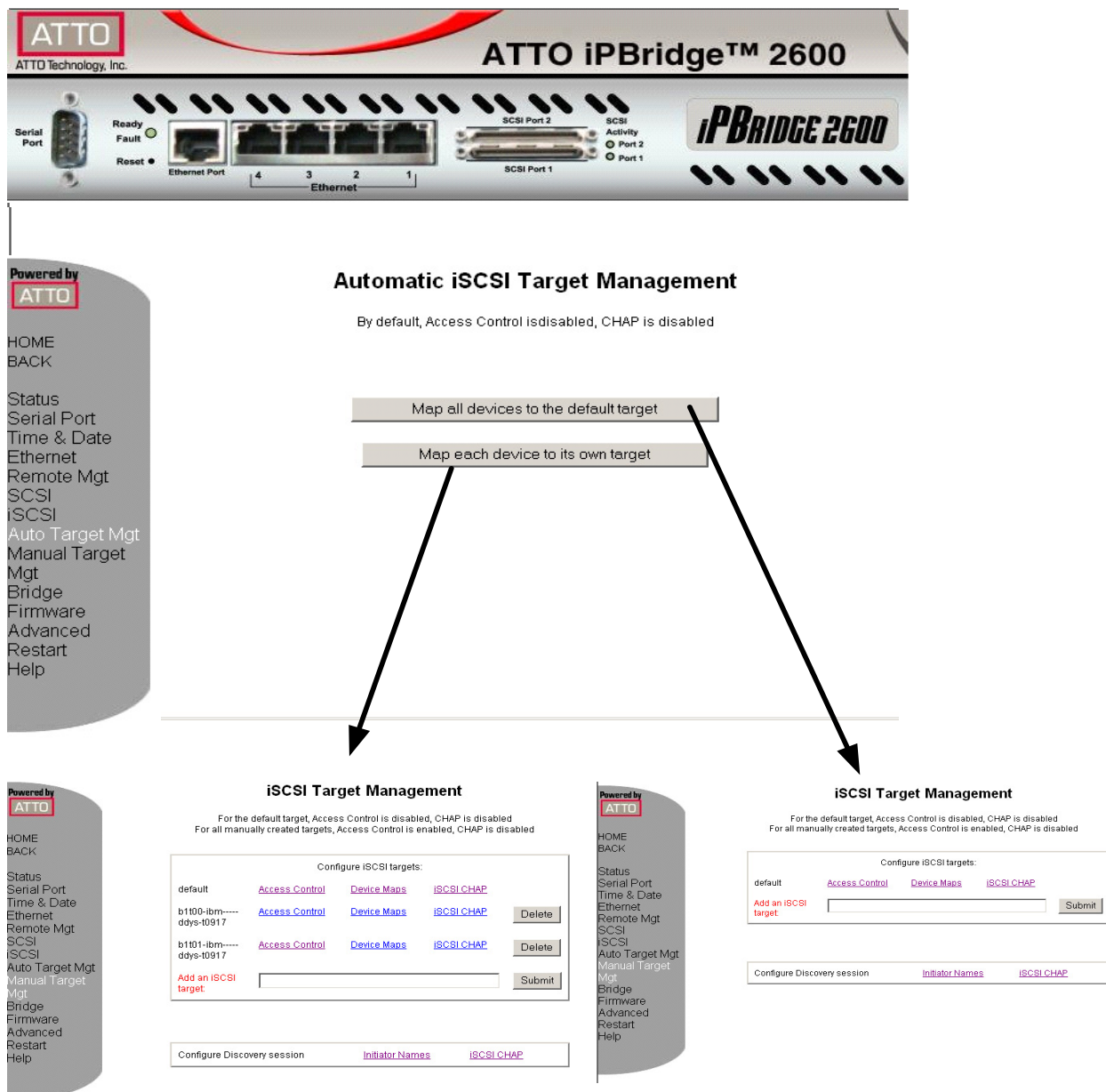
Physical connections



Mapping: default vs. multiple target nodes



*Exhibit 2.1-2 After clicking on the **Auto Target Mgt.** menu item: the results of clicking either **Map all devices to the default target** or **Map each device to its own target** on the **Automatic iSCSI Target Management** page.*



*Exhibit 2.1-3 The **Manual Target Mgt.** menu item brings you to the **iSCSI Mapping** page where you may view or modify the iSCSI mapping, the Access Control lists, and the iSCSI CHAP configuration.*

Powered by **ATTO**

HOME
BACK
Status
Serial Port
Time & Date
Ethernet
Remote Mgt
SCSI
iSCSI
Auto Target Mgt
Manual Target Mgt
Bridge
Firmware
Advanced
Restart
Help

iSCSI Mapping

Jump to target...

for default

Submit Automap

LUN 0 Bridge LUN	LUN 8	LUN 16	LUN 24
LUN 1 Port: 1 FCLUN: 0	LUN 9	LUN 17	LUN 25
LUN 2 Port: 1 FCLUN: 0	LUN 10	LUN 18	LUN 26
LUN 3	LUN 11	LUN 19	LUN 27
LUN 4	LUN 12	LUN 20	LUN 28
LUN 5	LUN 13	LUN 21	LUN 29
LUN 6	LUN 14	LUN 22	LUN 30
LUN 7	LUN 15	LUN 23	LUN 31

Unmapped Fibre Channel Devices

Port: 1
FCLUN: 0

Vendor: IBM
Product: IC35L036F2DY10-0
Device Type: Disk
Serial Number: E3VQJN9B

Port: 1
FCLUN: 0

Port: 1
FCLUN: 0

Port: 1
FCLUN: 0

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HOME
BACK
Status
Serial Port
Time & Date
Ethernet
Remote Mgt
SCSI
iSCSI
Auto Target Mgt
Manual Target Mgt
Bridge
Firmware
Advanced
Restart
Help

Access Control

Jump to target...

for default

Access Control: ☐ enabled ☒ disabled

List of Initiators

iqn.1991-05.com:microsoft:brohdepx.attotech.com
iqn.1987-05.com:cisco:01.6cee65bcb80
iqn.1991-05.com:microsoft:atto-bj2s1ivzvt

Allowed Initiators

Add >>

<< Remove

Submit

Create new Initiator name

Create

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Powered by **ATTO**

HOME
BACK
Status
Serial Port
Time & Date
Ethernet
Remote Mgt
SCSI
iSCSI
Auto Target Mgt
Manual Target Mgt
Bridge
Firmware
Advanced
Restart
Help

iSCSI CHAP Configuration

Jump to target...

for ibm-----ic35l036f2dy-000

iSCSI CHAP: ☒ enabled ☐ disabled

CHAP Out Secret: DefaultOutSecret

Initiator Account

CHAP In Secret

Submit

2.2 Additional configurations

Additional configurations to improve usability and security are available on the iPBridge. Use ATTO ExpressNAV or the Command Line Interface.

Set the Real Time Clock

Before proceeding you should set the Real Time Clock. You can set the time automatically by using the Simple Network Time Protocol (SNTP). SNTP is enabled by default.



Note

The iPBridge must remain powered on for more than 24 hours to ensure the date and time are set.

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.
- 2 Type in the current user name and password.
- 3 On the left-hand side menu, click **Time & Date**.
- 4 If you are using a time server on your network to set the time,
 - a. Click **Simple Network Time Protocol enabled**.
 - b. Type the IP address of the time server in the **Time Server** text box.
 - c. Click **Submit**.
- 5 If you are setting the time manually, click **Simple Network Time Protocol disabled**.
 - a. Click **Submit**.
 - b. Select a time zone from the **Time Zone** drop-down choices.
 - c. In the box marked **HH:MM:SS** enter the desired time in hours, minutes, and seconds.
 - d. In the box marked **MM:DD:YYYY** enter the desired month, day, and year in digits.
 - e. Click **Submit**.

Change the current user name, password

It is best practice to change the default user name and password to a user name and password significant to you.

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found

in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.

- 2 On the left-hand side menu, click **Bridge**.

The **Bridge Configuration** page is displayed. The user name that you are currently logged in with is displayed in the **Username** text box.

- 3 Enter appropriate information into the **Username**, **Current Password**, **Old Password**, **New Password**, and **Confirm Password** text boxes.



Note

The user name is case insensitive and password is case sensitive.

- 4 Click **Submit**.
- 5 The user name and password for all Telnet, FTP and ATTO ExpressNAV sessions is changed.

Create a read only password or user name

You may set a read only password or a read only user name. Refer to [General use commands](#) on page 37.

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.
- 2 On the left-hand side menu, click **Bridge**.

The **Bridge Configuration** page is displayed. The user name that you are currently logged in with is displayed in the **Username** text box.
- 3 Enter the Admin password in the first line of the boxed area.
- 4 Enter the desired information into the **Admin Username**, **New Admin Password**, **Confirm New Admin Password** or **New Read Only Password** and **Confirm New Read Only Password** text boxes.

The user name is case insensitive and password is case sensitive.

- 5 Click **Submit**.

The user name or password for all Telnet, FTP and ATTO ExpressNAV sessions are changed.

Enhance performance

Default settings are appropriate for most systems. However, you may wish to enhance performance using the ATTO ExpressNAV user interface.

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.
- 2 Click through the menu items at the left side of the screen to view settings and possible changes.
- 3 To improve performance, note these settings:
 - On the **iSCSI** page, enable **SpeedWrite**
 - On the **Ethernet** page, change **MTU** to **9014**

Set up a VLAN: Virtual Local Area Network

A Virtual LAN (VLAN) is a group of devices on the same physical LAN which can communicate with each other as if they were all on different physical LANs. This creates a network that is independent of physical location, allows grouping of users into logical work-

groups, increases efficient use of resources, and adds security options by allowing some users into the LAN and keeping other users out.

You may create up to eight Virtual LAN IDs for each Ethernet data port. Each VLAN ID is assigned a VLAN name of up to 64 characters. If no VLAN ID exists for a data port, VLAN is disabled for that port.

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.
- 2 From the left-hand menu, click on the **Ethernet Port Configuration** page.
- 3 Click on the data port you wish to configure.
- 4 Add a VLAN ID number and name in the appropriate boxes.
- 5 Press **Submit**.

After rebooting, Virtual LAN is in effect.

For details on the commands used to set up a VLAN, refer to [Ethernet commands](#) on page 47.

3 Remote system monitoring

You may set up the iPBridge to send notifications when certain events occur.

Use the **Remote Management** page of the ExpressNAV interface to send information about the operation of the iPBridge.

CLI commands may be used to set up remote monitoring. Refer to [Diagnostic commands](#) on page 39.

You may designate the person receiving notification of conditions and the level of severity which prompt notification. For example a recipient with a critical severity level only receives critical messages and not warning messages.

E-mail notification

E-mail notification using SMTP (Simple Mail Transfer Protocol) allows the iPBridge to send an E-mail message to you, a network administrator or other users when certain events occur:

- critical and warning temperature conditions
- critical and warning voltage conditions
- power is on

The severity level can be **all**, **warning**, **critical** or **none**.

- **All** means warnings, critical events and informational messages are sent.
- **Critical** means only critical event notifications are sent.
- **Warning** means only warnings and critical event notifications are sent.
- **None** means no notification is sent.

When an event occurs that warrants E-mail notification, the iPBridge scans each of its ports until the E-mail is sent successfully. Each attempt takes one minute. The E-mail function only sends messages; it cannot respond to a rejection by a server for an invalid address.

Each E-mail is time stamped when it leaves as part of the SMTP header information.

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.

- 2 Click on the **Remote Management** page menu item.
- 3 Click on the **enable** button in the Email Notification line.
- 4 Enter the SMTP Server IP address provided by your IT administrator which is the **from** address included in the E-mail.

If authentication is required by the SMTP Server,

- a. Go to the **Advanced CLI** page.
- b. Type

```
set emailusername
```

- c. Click **Submit** or press **Enter**
- d. Type

```
set emailpassword [password]
```

- e. Click **Submit** or press **Enter**
- f. When the iPBridge has restarted, return to ExpressNAV **Remote Management** page (refer to steps 1 and 2 of this procedure).

- 5 Enter the **Recipient** E-mail address(es).
- 6 From the drop-down box next to each recipient E-mail address, select the level of severity for which you want each address to be notified.
- 7 Press **Submit**.

After rebooting, the iPBridge sends E-mail notifications as you set them up. Exhibit 3.0-1 shows the format of the E-mail message.

Exhibit 3.0-1 The E-mail messages sent by the iPBridge follow this format.

```
Subject: [The Type of Event that Occurred]
Message Body:
This is a status message from [BridgeName]. Identifying information as well as
the most recent entries from the event log appear below.
***** Unit Information *****
Serial Number : [Serial Number]
IP Addresses: [IP Address1]
               [IP Address2]
               etc...
***** Event Log Entries *****
[Listing of the ten latest event log entries]
```

Simple Network Management Protocol (SNMP)

Remote system monitoring is also available using Simple Network Management Protocol (SNMP). An agent resides in the iPBridge which takes information from the iPBridge and translates it into a form compatible with SNMP. If certain conditions arise, the agent sends notifications (traps) to a client.

The severity level can be **all**, **warning**, **critical** or **none**.

- **All** means warnings, critical events and informational messages are sent.
- **Critical** means only critical event notifications are sent.
- **Warning** means only warnings and critical event notifications are sent.
- **None** means no notification is sent.

Refer to [Diagnostic commands](#) on page 39 for detailed information on the commands which regulate SNMP on the iPBridge.

Contact your network administrator for the MIB software and appropriate MIB file for your iPBridge.

Use the **Remote Management** page of the ExpressNAV interface to enable traps or extended traps, to designate the trap recipient IP addresses, and to indicate the severity level.

Setting up SNMP

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.
- 2 In the left-hand menu, click on the **Remote Management** page.
- 3 Click on the **enable** button in the **Traps** or **Extended Traps** line.
- 4 Enter the **Trap Recipient IP addresses**.
- 5 From the drop-down box next to each trap address, select the level of severity for which you want each address to be notified.
- 6 Press **Submit**.

After rebooting, the iPBridge sends notifications as you set them up.

4 Updating firmware

*Several processors control the flow of data in the ATTO iPBridge. The firmware to control these processors can easily be upgraded in the field using the ATTO ExpressNAV interface or the **PUT** command from an FTP connection. The ATTO ExpressNAV method is preferred.*

Preliminary steps

- 1 The iPBridge firmware is distributed as a compressed .zip file and can be obtained from the ATTO Technology, Inc. web site at www.attotech.com or from the CD included with your iPBridge.
- 2 Uncompress the .zip file into an image file (.ima). Note the filename.



CAUTION

Before beginning this procedure, ensure that all I/O to the iPBridge has stopped.

During this procedure, *do not* interrupt the flash process.

Do not power down the host or the iPBridge until the display returns the Ready prompt.

Interrupting the flash process will make your iPBridge inoperable and you will have to return it to ATTO Technology for repair.



Note

The recommended management tool for the iPBridge is ATTO ExpressNAV.

Using ATTO ExpressNAV

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found

in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.

- 2 From the left-hand menu, click on the **Firmware** page.
- 3 Click **Browse** and locate the firmware you unzipped in the preliminary steps.
- 4 Click **Upload** and wait until a success message is displayed.
- 5 Click the **Restart** link.
- 6 Click on **Restart**.

Using FTP over GbE

- 1 Establish an FTP link to the bridge that is to be flashed.



Note

The default user name is **root**; it is case insensitive. The default password is **Password**; it is case sensitive. It is best practice to change the passwords. Refer to [Additional configurations](#) on page 13.

- 2 Use the **PUT** command to download the firmware you unzipped in the preliminary steps. For example
c:\bridge_firmware\ibrg0370.ima
- 3 Once the download is complete, cycle power on the iPBridge or use the **FirmwareRestart** CLI command.

5 Troubleshooting

If it is clear that a particular component system is at fault in a problem situation, go directly to that component. If it is not clear, the best approach is to troubleshoot using the inside-out method.

You may check on the status of your iPBridge using the ExpressNAV interface. Refer to [ATTO ExpressNAV interface](#) on page 25 to see which pages may contain the information you need. You may also look for information by using the diagnostic CLI commands, enumerated in [Diagnostic commands](#) on page 39, in the Advanced page of the ExpressNAV

interface, or by using the CLI directly (refer to [CLI provides ASCII-based interface](#) on page 31.)

To start and use the ExpressNAV interface, including how to access the version information, refer to [ATTO ExpressNAV interface](#) on page 25.

Inside out method

To troubleshoot using the inside out method, begin with the device(s) connected to the iPBridge first, then work your way out.

- SCSI devices
 - iPBridge SCSI ports
 - iPBridge internal configuration
 - iPBridge Ethernet/IP ports
 - LAN/WAN
 - Ethernet host adapter or NIC in host
 - iSCSI OS driver
 - OS
 - Application

Check the host event log

Check the event log on the host. Look for the most recent entries and determine what could be causing a

problem, then go to that event and continue troubleshooting.

Check the iPBridge event and trace logs

Check the iPBridge event log through the CLI. Refer to [Diagnostic commands](#) on page 39. Look for the most recent entries and determine what could be

causing a problem. Then go to that event and continue troubleshooting.

Visually inspect LEDs

Light Emitting Diodes (LEDs) are located on both sides of the iPBridge

Refer to [LED indicators](#) on page 4 and Exhibit 1.1-1 on page 4.

Check host versions

Check the following to find problems on attached hosts:

- Operating system version
- Service pack version
- Host adapter version

- Host adapter firmware version
- Host adapter device driver version
- iSCSI driver version

If an update is required, perform the update. For an updated list of supported iPBridge host platforms and host adapters, visit www.attotech.com.

Check iPBridge product versions

For a current list of required updates, visit www.attotech.com.

- 1 If you are not already in the ExpressNAV GUI, type the IP address of your iPBridge, as found in [Discover the IP address](#) on page 5, in a standard browser and press **Enter**.

- 2 Click on the **Status** page and view the information on the product version.
- 3 If an update is needed, download the update from www.attotech.com. Refer to [Updating firmware](#) on page 17.

Component check

Use this procedure to check system components. For more information on the commands used in this procedure, refer to [CLI provides ASCII-based interface](#) on page 31.

Checking SCSI devices

- 1 Check SCSI devices to make sure they are all set to different SCSI IDs.
By default, the iPBridge SCSI ports use SCSI ID 7 so drives should use IDs 0 through 6 and 8 through 15.
- 2 Check the SCSI device power. Make sure the devices are powering up.
- 3 Watch the drive lights before, during, and after startup. Many drives have term power lights that should be on before startup and turn off when system boots.
- 4 Verify the external terminator is the correct type and does not have damaged pins.
- 5 Check cable integrity. Check the cables for solid connections. Make sure they are screwed down. Inspect cable ends for bent pins.
- 6 If termination is correct, and the problem persists, try drives one at a time with different cables, adding drives and cables until the problem occurs. This helps pinpoint the drive or cable causing the problem.
- 7 Check with the manufacturer of SCSI device(s) for further troubleshooting methods.

If SCSI devices appear to be working, move on to the iPBridge SCSI port section.

Checking the iPBridge SCSI ports

- 1 Verify the iPBridge has its termination set properly. By default, termination is `enabled`.
- 2 Either through the ATTO ExpressNAV or CLI, perform a SCSI bus scan on each SCSI port. Refer to [SCSI configuration commands](#) on page 49.

If no devices appear, re-check SCSI cables and termination. If garbage information appears, the problem is most likely a bad SCSI cable or termination.

- 3 Check the internal cabling of the SCSI device. LVD SCSI cable lengths are limited to 12.5 meters. Longer cable lengths can cause problems. Internal cabling is also considered when calculating total cable length. For details, refer to [Cabling](#) on page iii.
- 4 Some older SCSI devices improperly negotiate with the iPBridge SCSI port. If older devices are not showing up, contact your service representative.
- 5 If all devices appear, invoke the **ScsiTargets** command several times on each SCSI port to verify that the devices can be seen. If devices disappear then appear again, the problem is most likely a SCSI cable. For information on the **ScsiTargets** command, refer to [SCSI configuration commands](#) on page 49.

If all devices appear and remain, move to the iPBridge internal configuration section.

When changing any setting on the iPBridge the configuration must be saved by using either the **saveConfiguration** CLI command or through the ATTO ExpressNAV interface.

Checking the serial port

- 1 Verify you have the correct settings and that your terminal is configured to:
 - Baud rate: 115200
 - Data bits: 8
 - Stop bits: 1
 - Parity: off
 - Flow control: None
- 2 Verify that your serial cable is less than two meters in length.

Checking the iPBridge internal configuration

Verify that the SCSI devices are mapped properly. Check in the ATTO ExpressNAV interface or use the **routedisplay iSCSI** command to show mappings. If devices do not appear, power down the iPBridge and power back on. Refer to [Mapping devices: NDMP](#) on page 13, [Mapping devices: iSCSI](#) on page 15 and [Mapping commands](#) on page 57.

When changing any setting on the iPBridge, the configuration must be saved by using either the **saveConfiguration** CLI command or through the ATTO ExpressNAV **Restart** page.

Checking iPBridge Ethernet ports

- 1 Check Ethernet cable integrity. Check the cables for solid connections. Cat5 cable can cause connection issues with Gigabit Ethernet. Cat6 cable is the best cabling for the iPBridge.
- 2 Verify the IP address, subnet mask, and gateway are properly set on each data port on the iPBridge for your network environment. Refer to [Getting an IP address](#) on page 10.
- 3 Verify that the Ethernet speed is set to auto: invoke the **get EthernetSpeed all** command, check the **Ethernet** page of the ATTO ExpressNAV interface, or check the LED link lights to determine if the Ethernet speed is correct.
- 4 Determine if the iPBridge is set to get its IP information from a DHCP server. If so, verify that the DHCP server has available IP addresses. Refer to [Getting an IP address](#) on page 10.
- 5 Verify that each used Ethernet port on the iPBridge can be pinged from the desired host. Refer to [Ping](#) on page 52.

If the host cannot ping the iPBridge ports and the iPBridge ports are properly configured, continue to the Local Area Network/Wide Area Network section, [Checking the LAN/WAN](#) on page 21.

Verify that each port on the iPBridge can ping each desired host. Refer to [Ping](#) on page 52. If the iPBridge cannot ping the host, continue to [Checking the LAN/WAN](#) on page 21.

- 6 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host.
- 7 Some older switches/hosts cannot auto negotiate between the iPBridge and the

switch/host at the desired speed. You may have to force the host/switch or the iPBridge to the desired speed.

- 8 Verify that the host is logging into the iPBridge correctly by viewing the **Connections** page and determining if there a “session open” status.
- 9 Verify that you are using the correct log in procedure for your initiator. For example: When connecting using the Adaptec initiator, the log on screen requests the iPBridge iqn (iSCSI qualified name). If left blank, Adaptec cannot log in. Enter “iSCSI” into this field for auto iqn discovery.

When changing any setting on the iPBridge the configuration must be saved by using either the **saveConfiguration** CLI command or through the ATTO ExpressNAV interface.

Checking the LAN/WAN

- 1 Verify that the switch/switches are segmented properly so that hosts and the iPBridge have access to each other.
- 2 If there are routers involved in the setup, make sure the IP addresses and/or MAC addresses of the iPBridge are allowed through the router.
- 3 Verify that the switch can see the iPBridge on the port(s) in question. Refer to your switch vendor’s guide for more information.

Checking the iSCSI Host Adapter or NIC

iSCSI host adapters appear as a type of Storage Controller to the host OS, not as a standard NIC. These adapters usually have hardware acceleration to offload the TCP processing from the host. Configuration of these adapters is usually done through the vendor’s own utility and not through the OS itself.

NICs come in two types: accelerated and un-accelerated. Accelerated NICs use some hardware to offload some of the TCP processing from the host. Un-accelerated NICs make the OS do all TCP processing.

To check the iSCSI host adapter or NIC

- 1 Check cable integrity. Check the cables for solid connections. Make sure they are plugged in properly. Inspect cable ends for broken clips and improper wiring.
- 2 Verify that the iSCSI host adapter or NIC is configured with the correct IP information.
- 3 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host.

- 4 Verify that the hosts are running the recommended driver and firmware level for the iSCSI host adapter or NIC vendor.
 - 5 Verify that the hosts and the iPBridge are using the same port number to communicate via iSCSI. The default port number for the iPBridge is 3260. Refer to [iSCSI Port Number](#) on page 55.
 - 6 Make sure the host adapter/NIC is configured to log into the iPBridge. Some iSCSI host adapters do not re-login upon reboot or unplug/replug event without marking a check box.
 - 7 Some older switches cannot autonegotiate between the host and the switch properly. You may have to force the host or switch to the desired speed.
- 5 If using DHCP, verify that the DHCP server is assigning the correct IP information to the host. Refer to [Ethernet Port Configuration](#) on page 23.
 - 6 Verify that the NIC is configured with the correct IP information.
 - 7 Verify that the hosts and the iPBridge are using the same port number to communicate via iSCSI. The default port number for the iPBridge is 3260. Refer to [iSCSI Port Number](#) on page 55.
 - 8 Check cable integrity. Check the cables for solid connections. Make sure they are plugged in properly. Inspect cable ends for broken clips and improper wiring.

For a NIC using an OS iSCSI driver, continue to the iSCSI OS driver section.

Checking the iSCSI OS driver

This section is for hosts using a driver that allows the OS to talk to iSCSI targets via a NIC, not an iSCSI storage adapter.

- 1 A PC using an iSCSI storage adapter and an iSCSI OS driver might not work correctly on the same machine. Check with the vendors to make sure they are compatible.
- 2 Verify that the PC has the latest iSCSI driver as well as the required service packs and patches. Check with the iSCSI OS driver vendor for more information.
- 3 Verify that the iSCSI OS driver has started. Look under **Device Manager** for Windows or **lsmod** for Linux.
- 4 Verify that the iSCSI OS is still looking for the iPBridge at the right IP address.

Checking the Operating System

- 1 Verify that the OS has the required service packs or patches installed. If not, obtain the proper service packs and patches and install them.
- 2 Some iSCSI host adapters and iSCSI OS drivers do not always automatically find new targets when plugged in or when forced to rescan. Reboot the hosts.
- 3 Check if the vendor has a new driver. If so, install it.

Checking the applications

- 1 Verify that the application is running the latest device drivers for the devices connected to iPBridge. If not, get the latest device drivers and install them.
- 2 Verify with the application vendor if the iSCSI technology is supported on the version of the application being used.

Performance issues

If the host is not getting the performance it should, check the following items.

Checking SCSI devices

- 1 Verify that the devices are running at their highest possible SCSI speed. Refer to [SCSI configuration commands](#) on page 47.
Mixing SE and LVD devices on the same SCSI bus forces the speed of the bus to SE, thus slowing faster LVD devices. The iPBridge cannot accelerate an already slow device. Refer to [Connecting SCSI devices to SCSI ports](#) on page iii of the Appendix.
- 2 Verify that the proper terminator is being used. An SE terminator forces the SCSI bus to SE speeds.

Checking iPBridge SCSI ports

- 1 Verify that the SCSI port configuration is set to the highest speed using the ATTO ExpressNAV interface or CLI. Refer to [SCSI configuration commands](#) on page 47.
The iPBridge SCSI port speed, wide negotiation, and sync negotiation settings all affect the speed of the port. By default, these settings are set for optimal speed.
- 2 Verify that the SCSI devices are equally distributed between the SCSI ports. Refer to [Alternative interface options](#) on page 33.
Optimal performance is seen when only two high-speed SCSI devices are connected to each SCSI port.

Checking iPBridge Ethernet ports

- 1 Verify that the data ports are set to auto negotiate or forced to 1000 Mbs. Refer to [Ethernet Port Configuration](#) on page 23.
- 2 Verify that the MTU size is set to optimal setting for the LAN/WAN environment.
Refer to [Ethernet Port Configuration](#) on page 23. The current optimized frame size for the iPBridge is 9k. Smaller frame sizes cause a decrease in performance.
- 3 Verify that the iPBridge TraceLog feature is disabled. Tracelog tracks certain events that occur in the iPBridge. With this log enabled, performance suffers.
Refer to [Diagnostic commands](#) on page 43.

Checking the LAN/WAN

- 1 Verify that the MTU size is set to optimal setting for the LAN/WAN environment. Refer to [Ethernet Port Configuration](#) on page 23.
9k frame size is the current optimized frame size for the iPBridge. Smaller frame sizes cause a decrease in performance. Many switch and router vendors do not support the larger frame size of 9k or 16k.
- 2 Verify that each associated port in the IP SAN is configured for 1000Mbs.
IP SAN traffic should be segmented so that it does not interfere with the main LAN network traffic. For better performance, the IP SAN should be on its own set of hardware.
- 3 Verify that packets are not being dropped along the LAN/WAN. Many utilities track packet activity and switch statistics.

Checking Ethernet Host Adapter or NIC

Ethernet Storage Adapters generally outperform accelerated NICs and un-accelerated NICs by offloading most of the processing from the host.

An accelerated NIC provides some offloading, but still requires a host OS iSCSI driver, making the host spend more CPU cycles.

An un-accelerated NIC does not offload anything so the CPU must do much of the processing.

To check the Ethernet host adapter or NIC

- 1 Verify that the adapter or NIC is set to auto-negotiate or forced to 1000 Mbs.
- 2 Set the MTU size to the largest MTU size supported in the LAN/WAN. Refer to [Ethernet Port Configuration](#) on page 23.
9k frame size is the current optimized frame size for the iPBridge. Smaller frame sizes cause a decrease in performance. Many switch and router vendors do not support the larger frame size of 9k or 16k. Set the maximum transfer size to the most efficient size for the intended target(s). For many tape drives, 64k is the optimal setting.

Checking the applications

Some applications can be configured to change transfer sizes. Configure the application for the optimal size for the particular SCSI device(s) connected to the iPBridge.

Checking the host system

The faster the host, the faster your transfer times are. The work flow goes only as fast as the slowest connection in the host system, so transferring data from an IDE drive, 100Mb connection, a DLT 4000, a high speed RAID volume across the country, or other applications, slows the system no matter how fast everything else is in the system.

- 1 Verify that the iSCSI storage adapter or NIC is connected to the fastest PCI bus connector supported by the adapter or NIC.

If the adapter supports PCI-X, place the adapter in a PCI-X slot. If one is not available, the host might not achieve the optimal performance capable from the adapter.

Even placing a PCI-X adapter into a 64 bit 66 MHz slot loses performance. Some adapters

adjust clock speed depending on the speed of the PCI slot into which they are plugged.

- 2 The host OS disk and swap disk/partition/file should be on a high speed drive such as a SCSI drive to minimize the time needed to access the host's virtual memory.

The more memory a system has, the less time it spends accessing virtual memory (hard drive space).

Checking the Operating System

If possible, eliminate swap space and virtual drives which require large amounts of system memory.

However, the OS might not allow the elimination of swap space. An OS set to run many kinds of different servers spends much of its CPU cycle on other operations, thus slowing down performance.

6 ATTO ExpressNAV interface

The easiest way to communicate with the ATTO iPBridge is to use the browser-based interface. ATTO ExpressNAV. This chapter provides additional information about the interface and how to use it.

The recommended management tool for the iPBridge is ATTO ExpressNAV, a web-based interface which may be accessed from any web browser that supports the latest standards for XHTML 1.0 and CSS1.

To take full advantage of the ExpressNAV interface you should have Java script enabled through your browser.

Browser compatibility

To make ExpressNAV as compatible as possible with as many browsers as possible, all pages are written in pure XHTML 1.0 and CSS1. It is compatible with the latest versions of Internet Explorer, Netscape, Mozilla (including K-Meleon, Camino, Mozilla Firefox, Epiphany and Galeon), and KHTML (including Konqueror and Safari).

Minimum requirement for Windows-based systems is Internet Explorer 5.5 and Netscape 6.2. The minimum requirement for Macintosh browsers is Internet Explorer 5.2 or Safari 1.2.

Open an ExpressNAV session

- 1 Obtain the IP address of the iPBridge management port (mp1). This address was set in [Discover the IP address](#) on page 5.
- 2 Type in the IP address of the iPBridge into your browser.
- 3 The **ExpressNAV** home page is displayed. Click **Enter**.
- 4 Enter the user name and password values. The default values are user name: "root" and password: "Password". The user name is case insensitive and password is case sensitive.



Note

It is best practice to change the default user name and password after you have configured your iPBridge. Refer to [Set the Real Time Clock](#) on page 13.

The **Status** page appears.

- 5 Follow the links to find information or configure your iPBridge. Each link takes you to a page such as the **Time & Date Configuration** page in Exhibit 6.0-1. Refer to [ATTO ExpressNAV pages](#) on page 27 for details on all ExpressNAV pages.

Exhibit 6.0-1 An ExpressNAV page

The image shows the ATTO iPBridge™ 2600 hardware and its ExpressNAV web interface. The hardware unit features a Serial Port, Ethernet Port, four Ethernet ports (labeled 4, 3, 2, 1), and two SCSI ports (labeled SCSI Port 2 and SCSI Port 1). The web interface includes a sidebar with navigation options and a main configuration area for Time & Date settings.

Hardware Labels:

- Serial port icon
- Ethernet port icon
- Ethernet ports icon
- SCSI port icon

Web Interface Labels:

- Product faceplate graphic** provides links to specified ports
- Powered by ATTO**
- Sidebar:** select the item you wish to view
 - HOME
 - BACK
 - Status
 - Serial Port
 - Time & Date
 - Ethernet
 - Remote Mgt
 - SCSI
 - iSCSI
 - Auto Target Mgt
 - Manual Target Mgt
 - Bridge
 - Firmware
 - Advanced
 - Restart
 - Help
- Time & Date**
 - Remote Time Server Configuration
 - Simple Network Time Protocol: ☒ enabled ☐ disabled (Radio buttons)
 - Time Server: 192.43.244.18 (Text fill-in)
 - Time Zone: EST (Drop-down box)
 - Manually Set Time/Date
 - HH:MM:SS: 19:46:35
 - MM/DD/YYYY: 02/02/2000 (Box grey because of other choices)
 - Submit button (Submit button same as typing all CLI commands and `saveconfiguration norestart`)
- Parameter name**
Red print provides link to help text

6.1 ATTO ExpressNAV pages

Each page in the ATTO ExpressNAV interface provides information and/or configuration parameters based on a specific topic. Each page can be reached through the menu at the side of each page. An image on each page's header shows each port in the product faceplate. Each port is clickable and also takes you to the appropriate page.

Status

Displays iPBridge information:

- Vendor ID, product ID, firmware revision number and serial number
- Valid temperature range, current temperature and current voltage
- Ethernet port IP addresses and status

Serial Port configuration

Configures the baud rate and echo parameters. Refer to [Serial port configuration commands](#) on page 45 for details on each option.

Time & Date configuration

Configures the real-time clock or accesses a remote time server. Configurable options are:

- Enable/disable Simple Network Time Protocol
- Time Server and time zone
- Manually set time and manually set date

Refer to [Maintenance commands](#) on page 43 for details each parameter.

Ethernet port configuration

Configures each port independently for the following parameters:

- Enable/disable DHCP
- IP address, gateway, subnet mask and Ethernet speed
- MTU

Refer to [Discover the IP address](#) on page 5 and [Ethernet commands](#) on page 47 for details.

Remote Management

Sends information about the operation of the iPBridge to an E-Mail address using an intranet or the Internet, or to an IP address using SNMP. You may designate the person receiving notification of conditions and the level of severity which prompt notification.

Refer to [Remote system monitoring](#) on page 15.

SCSI configuration

Configures each port independently for the following parameters:

- Bus speed
- Enable/disable sync transfer
- Enable/disable wide transfer
- Initiator ID
- Enabled/disable bus reset on startup
- Enable/disable bus termination

Attached devices are listed for each bus and you can reset each port from this screen.

Refer to [SCSI configuration commands](#) on page 49.

iSCSI configuration

Defines the iSCSI CHAP target name, account name and secret and configures the following parameters:

- iSCSI Alias
- iSCSI Port Number
- Enable/disable iSNSLoginControl
- Enable/disable SpeedWrite
- Enable/disable CHAP settings: direction (in or out)

Refer to [iSCSI commands](#) on page 51 for details on each parameter.

Auto, Manual Target Management

Maps storage devices using the designations for the iSCSI LUN. The easiest way to map devices is to use the Automatic Target Management feature.

To map devices, you must connect the devices to one of the iPBridge SCSI ports. To access mapped devices over Ethernet, you must have a host computer connected to one of the iPBridge Ethernet data ports.

Refer to [Target management](#) on page 7.

Bridge configuration

Defines a name for the bridge, sets an admin user name and password, a read only user name and password, restores defaults or configures the following parameters:

- Minimum and maximum operating temperature
- Operating temperature warning

- Enable/disable Identify Bridge
Refer to [Maintenance commands](#) on page 43 for details on each parameter.

Firmware update

Updates firmware using ExpressNAV. Refer to [Updating firmware](#) on page 17.

Advanced CLI configuration

Allows you to input any CLI command available through the iPBridge. See Exhibit 6.1-1 for an example. Refer to [CLI provides ASCII-based interface](#) on page 31 for information about CLI.

- 1 Type in the CLI command
- 2 Click the **Submit** button.
A text field beneath the box lists the most recent commands issued to the iPBridge through this page.
If you enter an incorrect parameter, the CLI help text is displayed, showing the parameters available.
- 3 If your entry was correct, type **saveconfiguration**
- 4 Click the **Submit** button. Your changes are implemented.

Restart

Implements a firmware restart of the bridge and makes permanent any changes you have made since the last firmware restart.

- 1 Click the **Restart** button.
A box tells you to wait until the counter gets to 0 and then the browser refreshes.
- 2 If the browser does not refresh after the counter gets to 0, click the link to refresh it manually.



Note

Restarting the firmware may take a few minutes.

Help

Gives help information about the command line interface commands and troubleshooting tips via links to pages with help text for each category of options and one link to the Troubleshooting Tips and FAQs page on the ATTO website, www.attotech.com, or from the CD included with your iPBridge.

Contact information for ATTO technical support is on the right.

Help is always available by pressing any word shown in red on the screen

*Exhibit 6.1-1 Command and response sequence in the **CLI Advanced Configuration** page.*

Ready prompt	Ready.
Command input	serialportecho
Error message	ERROR Invalid Command. Type 'Help' for command list.
	Ready.
	help serialportecho
	[set get] SerialPortEcho [enabled disabled]
Help text	SerialPortEcho controls whether characters are echoed to the RS-232 port. All non-control character keyboard input is output to the display when this parameter is enabled.
Correct input	Ready.
Response	get serialportecho SerialPortEcho = enabled
	Ready.

7 Alternative interface options

Alternative methods to using the ATTO ExpressNAV interface may be used to manage the iPBridge. ATTO ExpressNAV is the recommended interface.

Use the serial port or header

- 1 Connect a cable from iPBridge RS-232 serial port or header to the serial (COM) port on a personal computer.
- 2 Turn on the iPBridge.
- 3 Start a terminal emulation program on the personal computer, and use it to connect to the iPBridge. For example, if you are using HyperTerminal on a computer running a Windows operating system,
 - a. Type **iPBridge** in the **New Connection** dialog box.
 - b. Click **OK**.
 - c. In the **Connect To** dialog box, for the **Connect using field** select the COM port number to which your serial cable is connected.
 - d. Click **OK**.
 - e. In the COM Properties dialog box select the following values:
 - Bits per second: 115200
 - Data Bits: 8
 - Parity: None
 - Stop Bits: 1
 - Flow Control: None
 - Terminal type: ASCII
 - Echo: off
 - f. Click **OK**.
- 4 After you connect to the iPBridge, start-up messages are displayed. These messages are only displayed at start-up. The last line in the start-up message sequence is **Ready**. See the example in Exhibit 5 on page 29.



Note

*In serial port sessions, there is no prompt on the line below the word **Ready**. Begin typing commands in the blank line where the cursor is resting. No user name or password is required for serial port access.*

- 5 To verify that you have connected successfully, type **help** after the **Ready** prompt and press **Enter**.

- If a list of all available commands does not appear on the screen, review the steps in this section, check the cable, or contact service personnel until the problem is solved.

If you have difficulty using the serial port, verify that you have the correct settings and that your serial cable is less than two meters in length.

Use Telnet

Up to three Telnet sessions can be conducted simultaneously. A serial port session can use the CLI while Telnet sessions are open. Whichever session issues the first “set” CLI command can continue to issue set commands, while the other sessions can only issue “get” commands or display information. Once a connection is established, refer to [CLI provides ASCII-based interface](#) on page 31.

- 1 Connect to the iPBridge from a computer on the same Ethernet network.
- 2 Start a Telnet session.



Note

There is more than one way to connect to the iPBridge using a telnet program. Your telnet program may operate differently than in the following instructions.

- 3 At the telnet prompt, issue the **open** command where x.x.x.x is the IP address of the iPBridge.

```
telnet > open x.x.x.x
```

- 4 If you have to specify a port type, enter the port type “telnet” and the terminal type “vt100”.

```
port type: telnet
terminal type: vt100
```

- 5 Enter the default values for the user name, “root”, and the password, “Password”, if you did not set new values in [Set the Real Time Clock](#) on page 13.

Exhibit 7.0-1 Start up messages.

```
ATTO iPBridge 2600
(c) 2002 - 2006 ATTO Technology, Incorporated.

Firmware version 001C release date Mar  9 2006, 17:54:13 Build 001C
Base version      9.00

255 Megabytes of RAM Installed.

4 GbE Data Port(s).
2 Ultra320 SCSI Interface Port(s).

World Wide Name = 20 00 00 10 86 30 01 78
Serial Number   = "IPB2600100003"
User-defined name = "UnitDflt"

Internal Temperature = 38 C [0 - 70]

For help, type HELP.
Active Configuration = ATTO
Mar  9 2006 17:54:13 001C Initialization Complete
STM41T0 RTC initialized
SCSI Interface 1 PCI Config Test Passed
SCSI Interface 1 Initialization Passed
SCSI Interface 2 PCI Config Test Passed
SCSI Interface 2 Initialization Passed

Initializing Port DP1.....
Initializing Port DP2.....
Initializing Port DP3.....
Initializing Port DP4.....
Initializing Port MP1.....
GBE hardware Init done.

Power-On Self-Test (POST) Completion Status: GOOD

Ready.
```

7.1 CLI provides ASCII-based interface

The command line interface (CLI) provides access to the ATTO iPBridge Services through a set of ASCII commands. CLI commands may be entered while in CLI mode.

iPBridge Services provide configuration and monitoring for the iPBridge. CLI commands may be entered while in CLI mode or on the ExpressNAV interface **Advanced CLI** page.

- CLI commands are context sensitive and generally follow a standard format

```
[Get | Set] Command [Parameter 1 |  
Parameter 2]
```

followed by the **return** or **enter** key

- CLI commands are case insensitive: you may type all upper or all lower case or a mixture. Upper and lower case in this manual and the **help** screen are for clarification only.
- Commands generally have three types of operation: get, set and immediate.
- The get form returns the value of a parameter or setting and is an informational command.

Responses to get commands are specified in the Results field for each command, followed by **Ready**.

- The set form is an action that changes the value of a parameter or configuration setting. It may require a **SaveConfiguration** command and a restart of the system before it is implemented. The restart can be accomplished as part of the **SaveConfiguration** command or by using a separate **FirmwareRestart** command. A number of set commands may be issued before the **SaveConfiguration** command.

Responses to set commands are either an error message or **Ready**. *. The asterisk indicates you must use a **SaveConfiguration** command to finalize the set command.

SaveConfiguration asks if you want to restart the system or not.

- Commands which do not require a **SaveConfiguration** command are immediately executed.

Responses to commands are either an error message or data results followed by **Ready**.

For an example of a typical CLI command and response, see Exhibit 7.1-2 on page 32.

Exhibit 7.1-1 Symbols, typefaces and abbreviations used to indicate functions and elements of the command line interface used in this manual.

Command conventions

Symbol	Indicates	Symbol	Indicates
[]	Required entry	Boldface words	must be typed as they appear
< >	Optional entry	Italicized words	Arguments which must be replaced by whatever they represent
	pick one of	mp1	Management port
...	Ellipses, repetition of preceding item	Dp	Data port (1<= Dp <= 4)
\n	end of line	fp	Fibre Channel port (1<= fp <= 2)
-	a range (6 – 9 = 6, 7, 8, 9)	fcidx	index field taken from the most recent FCTargets command

CLI Error Messages

The following error messages may be returned by the Command line Interface:

```
ERROR. Invalid Command. Type 'Help' for command list.  
ERROR. Wrong/Missing Parameters  
Usage: <usage string>  
ERROR. Command Not Processed.
```

Exhibit 7.1-2 If you enter a parameter for a CLI command incorrectly, the CLI help file displays with the error message:

Incorrect entry	Ready. set optempwarn 55
Error message including correct parameters as listed in Help	ERROR Wrong/Missing Parameters Usage: [set get] OpTempWarn [0 - 15]
Correct entry	Ready. set optempwarn 10
Response	Ready. *

7.1.1 CLI commands summary

A summary of the Command Line Interface commands, their defaults, an example of how they might be used, and where you can find the specifics of the command. Commands which have no default values associated with them have a blank entry in that column of the table.

Command	Defaults	Example	Page
AccessControl	default node = disabled other node = enabled	set accesscontrol default disabled	53
AccessEntry		get accessentry default all delete	53
AutoMap		automap	53
AutoMapOnBoot	disabled	set automaponboot enabled	53
BridgeModel		get bridgemodel	39
BridgeName	iPBridge	set bridgename Omega6	39
ClearEventLog		cleareventlog	39
ClearTraceLog		cleartracelog	39
Date		set date 03/03/2005	43
DeleteAllMaps		deleteallmaps	53
DisplayEventLog		displayeventlog	39
DisplayEventLogFilter	all all	set displayeventlogfilter gen info	39
DisplayTraceLog		displaytracelog	39
DisplayTraceLogFilter	all all all	set displaytracelogfilter all all chkcond	39
DPMTU	1514	set dpmtu all 9014	47
DumpConfig		dumpconfig	40
DumpEventLog		dumpeventlog	40
DumpTraceLog		dumptracelog	40
EmailFromAddress		emailfromaddress anyone@attotech.com	40
EmailNotify	disabled	emailnotify enabled	40
EmailNotifyAddress		set emailnotifyaddress 1 anyone@attotech.com critical	40
EmailPassword		set emailpassword barbw55	40
EmailServerAddress	0.0.0.0	emailserveraddress 152.32.3.1	40
EmailUsername		get emailusername bwallace	40
EthernetSpeed	auto	set ethernetspeed dp1 100	47
EventLog	enabled	set eventlog disabled	40
EventLogFilter	all all	set eventlogfilter gen info	40
Exit		exit	47
FirmwareRestart		firmwarerestart	43
Help		help fcdatarate	37, 41
IdentifyBridge	disabled	set identifyBridge enabled	37, 41

Command	Defaults	Example	Page
Info		info	41
IPAddress	dp1=10.0.0.1 dp2=10.0.0.2 dp3=10.0.0.3 dp4=10.0.0.4 mp1=10.0.0.5	get ipaddress dp1	47
IPDHCP	enabled	set ipdhcp all disabled	47
IPGateway	0.0.0.0	set ipgateway dp1 200.10.22.3	47
IPSubnetMask	255.255.0.0	get ipsubnetmask dp1	47
ISCSIAlias	" "	set iscsialias diamond	51
iSCSIChap	disabled	set iscsichap enabled	51
iSCSIChapSecret	" "	set iscsichapsecret in Data1 barbara556d12345	51
iSCSIInitiators		iscsiinitiators	51
iSCSIPortNumber	3260	get iscsiportnumber dp4	51
iSCSITarget		iscsitarget newtarg	51, 53
iSCSITargetNameDisplay		iscsitargetnamedisplay	52
iSCSIWANIPAddress		get iSCSIWANIPAddress all	52
iSNSLoginControl	disabled	set isnslogincontrol enabled	51
iSNSServer	0.0.0.0	get isnsserver	51
IsReserved		isreserved	41
MaxOpTemp	70	get maxoptemp	43
MinOpTemp	0	set minoptemp 10	43
OpTempWarn	5	set optempwarn 15	43
Password	Password	set password	43, 47
Ping		ping dp1 192.42.155.155	47
ReadOnlyPassword	Password	set readonlypassword	47
ReadOnlyUsername	user	set readonlyusername	47
Reserve		reserve	43
RestoreConfiguration		restoreconfiguration default	37, 43
RMON		get rmon 3 1	41
Route		route iscsi default 2 SCSI 1 3	53
RouteDisplay		routedisplay iscsi	53
SaveConfiguration		saveconfiguration restart	37
SCSIDomainValidation		scsidomainvalidation	49
SCSIInitID	0x07	set scsiinitid 1 1	49
SCSIPortBusSpeed	Ultra 320	set scsiportbusspeed 1 fast	49
SCSIPortList		scsiportlist	49
SCSIPortReset		scsiportreset 1	49

Command	Defaults	Example	Page
SCSIPortResetOnStartup	enabled	set scsiportresetonstartup 1 disabled	49
SCSIPortSyncTransfer	enabled	set scsiportsynctransfer 1 disabled	49
SCSIPortTermination	enabled	set scsiporttermination 1 disabled	49
SCSIPortWideTransfer	enabled	get scsiportwidetransfer 1	49
SCSITargetLUNs	8	set sscitargetluns 1 64	50
SCSITargets		scsitargets 1	50
SerialNumber		get serialnumber	41
SerialPortBaudRate	115200	set serialportbaudrate 19200	45
SerialPortEcho	enabled	get serialportecho	45
SNMPDumpMIB		snmpdumpmib	42
SNMPExtendedTraps	disabled	set snmpextendedtraps enabled	42
SNMPTrapAddress	0.0.0.0 none	set snmptrapaddress 6 192.42.155.155 all	42
SNMPTraps	disabled	set snmptraps enabled	42
SNTP	enabled	get sntp	44
SNTPServer	192.43.244.18	set sntpserver 129.6.15.28	44
SpeedWrite		speedWrite scsi all] disabled	49
SpeedWriteDefault	disabled	set speedwritedefault enabled	49
TailEventLog		taileventlog	44, 41
Temperature		get temperature	41
Time		set time 03:32:30	44
TimeZone	EST	set timezone pst	44
TraceLog	disabled	set tracelog enabled	42
TraceLogFilter	all all all	set tracelogfilter all all chkcond	42
Username	root	set username	44, 48
VerboseMode	enabled	set verbosemode disabled	37
VirtualDriveResponse	disabled	set virtualdriveresponse enabled	48
VLAN		get VLAN dp1	48
Voltage		get voltage all	42
WrapEventLog	enabled	set wrapeventlog disabled	42
WrapTraceLog	enabled	set wraptracelog disabled	42

7.1.2 General use commands

These CLI commands are used in a variety of situations

Help

Displays a list of available commands. If command name is specified, displays detailed command-specific information.

Help [command name]

Password

*Specifies a password for all sessions: TCP/IP, FTP and ExpressNAV web-based interface. You are prompted for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command **RestoreConfiguration default** sets the password to its default value.*

Default: Password

set Password

Requires a SaveConfiguration command

ReadOnlyPassword

*Specifies a read only password for all sessions: TCP/IP, FTP and ExpressNAV web-based interface. You are prompted for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command **RestoreConfiguration default** sets the password to its default value.*

Default: Password

set ReadOnlyPassword

Requires a SaveConfiguration command

ReadOnlyUsername

Specifies a read only user name for all TCP/IP, FTP and ExpressNAV web server sessions. User name is case insensitive, 1-32 characters with no spaces.

Default: user

set ReadOnlyUsername

Requires a SaveConfiguration command

get ReadOnlyUsername

RestoreConfiguration

Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option undoes any changes made since the last save.

RestoreConfiguration [Default | Saved]

SaveConfiguration

*Many commands require a SaveConfiguration command to be executed indicated by the return **Ready. ****

*When you invoke **SaveConfiguration**, the current configuration is permanently saved in the iPBridge and the new configuration becomes the active configuration.*

If a firmware restart is required to make the requested change permanent, a prompt asks you to confirm the restart. You can override this request by indicating the override value on the command line.

*You may make several changes through commands and **SaveConfiguration** before implementing the restart, but once you have restarted the iPBridge, all the command changes created before the restart and save are implemented. If you select the restart option, the iPBridge executes its complete start up cycle.*

***Restart** or **no Restart** parameter is optional*

SaveConfiguration <Restart| NoRestart>

Username

Specifies a user name for all TCP/IP, FTP and ExpressNAV web server sessions. User name is case insensitive, 1-32 characters with no spaces. Changes to the Admin Level user name requires an Admin Level password.

Default: root

set Username

Requires entering a password

Requires a SaveConfiguration command

get Username

VerboseMode

Specifies the detail of feedback for the command line interface. Disabling this option removes parameter names from action commands and removes descriptions from information commands. Choices are enabled or disabled

Default: enabled (returns have parameter information)

set VerboseMode [enabled | disabled]

get VerboseMode

7.1.3 Diagnostic commands

ATTO iPBridge diagnostic commands help validate iPBridge operation and diagnose/isolate iPBridge faults. Event logging is a mechanism for on-site observation of internal iPBridge behavior such as tracing commands received over the GbE from the host and return of data and status to the host.

BridgeModel

Reports model information about a specific iPBridge
get BridgeModel

BridgeName

Specifies name used to identify individual iPBridge units. May be up to a maximum of eight characters. It is not the World Wide Name (WWN).

set BridgeName [value]

Requires a SaveConfiguration command

get BridgeName

ClearEventLog

Clears the contents of the event log. No events are recorded until the command has been completed.

ClearEventLog

ClearTraceLog

Clears the contents of the trace log. No events are recorded until the command has been completed.

ClearTraceLog

DisplayEventLog

Displays the most recent page of event log entries. Typing a +, - or = causes the next, previous or same page of event log entries to be displayed. No events are recorded until the command has been completed. Type <escape> to disable the command, begin new log entries, and return to CLI.

DisplayEventLog < + | - | = | ESC >

DisplayEventLogFilter

*Filters the display of data using the **DumpEventLog** command for specific iPBridge subsystems when in **DisplayEventLog** mode. If enabled for a particular subsystem and level, that subsystem and level are masked when the command **DisplayEventLog** is issued.*

Subsystem entries:

FC
ENET
NVRAM
PERF
ECC
ALL
GEN
HTTP
iSCSI

Log level entries:

INFO
WARN
CRIT
FAIL
ALL

Default: disabled

set DisplayEventLogFilter [subsystem] [level]

get DisplayEventLogFilter [subsystem] [level]

DisplayTraceLog

Displays the most recent page of trace log entries. Typing a +, - or = causes the next, previous or same page of trace log entries to be displayed. No events are recorded until the command has been completed. Type <escape> to disable the command, begin new log entries, and return to CLI.

DisplayTraceLog < + | - | = | ESC >

DisplayTraceLogFilter

*Filters the display of data using the **DumpTraceLog** command for specific ports when in **DisplayTraceLog** mode. If **all** is set for a particular port, all information about that port are captured when the command **DisplayTraceLog** is issued. If **disabled** is set for a port, no trace log entries for the port are displayed.*

Default: all all all

set DisplayTraceLogFilter [scsi] [all] [sb | all] [chkcond | all]

get DisplayTraceLogFilter [scsi | all] [sb | all]

DumpConfig

Displays a unit's configuration to an RS-232 or TCP/IP session (over Ethernet) without impact on the log itself. (the log is not cleared). No events are recorded until the command has been completed.

DumpConfig

DumpEventLog

Dumps the contents of the entire event log to an RS-232 or TCP/IP session (over Ethernet) without impact on the log itself. (the log is not cleared). No events are recorded until the command has been completed.

DumpEventLog

DumpTraceLog

Dumps the contents of the entire trace log to an RS-232 or TCP/IP session (over Ethernet) without impact on the log itself. (the log is not cleared). No events are recorded until the command has been completed.

DumpTraceLog

EmailFromAddress

Configures the E-mail address that the bridge uses to talk to the E-mail server. The E-mail address must be a fully qualified Internet E-mail address, not more than 128 characters long.

EmailFromAddress [full email address]

EmailNotify

Turns email notification on or off.

Default: disabled.

set EmailNotify [enabled | disabled]

get EmailNotify

EmailNotifyAddress

*Configures notification addresses. **Index** is a number between 1 and 5 includes. **Full E-mail address** is a fully qualified Internet E-mail address, not more than 128 characters long. Warning level can be **All**, **Warning**, **Critical** or **None**. None means no E-mails are sent; Critical means only critical severity events prompt an E-mail; Warning means only warnings and critical events precipitate E-mail, and All means all warnings, critical events and informational messages warrant an E-mail.*

set EmailNotifyAddress [index] [full email address]
[warning level]

get EmailNotifyAddress < index | all >

EmailPassword

Configures the password used to authenticate the login to the SMTP email server. The password must not be more than 64 characters. A password is not required if the email server does not require authentication.

set EmailPassword

EmailServerAddress

Configures the address of the server that the bridge must contact in order to send out E-mail notifications.

set emailserveraddress [IP address]

get emailserveraddress

EmailUsername

Configures the username used to authenticate the login to the SMTP email server. The username must not be more than 128 characters. A username is not required if the email server does not require authentication.

set EmailUsername

get EmailUsername

EventLog

When enabled, records various system events to the event log.

Default: enabled

set EventLog [enabled|disabled]

Requires a SaveConfiguration command

get EventLog

EventLogFilter

Filters the display of data for specific iPBridge subsystems when in EventLog mode. If enabled for a particular subsystem and level, that subsystem and level are masked when the command EventLog is issued.

Subsystem entries

Log level entries

FC

INFO

ENET

WARN

NVRAM

CRIT

PERF

FAIL

ECC

ALL

ALL

GEN

HTTP

iSCSI

set EventLogFilter [subsys | All] [event level | all] [all | none]

Requires a SaveConfiguration command

get EventLogFilter [subsystem] [level]

Help

Displays a list of available commands. If command name is specified, displays detailed command-specific information.

Help <command name>

IdentifyBridge

Enabling this option causes the Fault LED on the front panel of the iPBridge to blink until the parameter is disabled.

Default: disabled

set IdentifyBridge [enabled|disabled]

get IdentifyBridge

Info

Displays version numbers and other production information for key components within the iPBridge

Info

IsReserved

Displays the reservation status of the current iPBridge session/interface.

If set, the configuration image is being modified by another iPBridge services session: set commands are temporarily unavailable but information commands are available.

Executing a SaveConfiguration, RestoreConfiguration or FirmwareRestart RELEASES the iPBridge so that other services users may access it.

When iPBridge services interface is RESERVED, set commands from other users are unavailable.

At least one interface must always have access to the iPBridge.

IsReserved

Ping

Ping sends an ICMP echo request to the specified host.

ping [DPn] | mp1] [xxx.xxx.xxx.xxx] <count <size>>

RMON

RMON collects and stores Ethernet data on data ports at specified intervals. Refer to [RMON](#) on page 48.

RouteDisplay

*Displays a list of iSCSI to SCSI mappings. The optional **LUN** parameter limits the list to the map which satisfies a search for the given **LUN**.*

NumEntries: decimal number of map lines displayed

Target Name: target name

LUN : target LUN

RouteDisplay iSCSI <Target Name> <LUN>

SerialNumber

Reports the iPBridge serial number which is unique for each iPBridge. The serial number tracks the board throughout its life and should not be changed for any reason. Set form requires operator privileges.

get SerialNumber

SNMPDumpMIB

Dumps the contents of the ATTO iPBridge private SNMP MIB to the current CLI session. Consult your network administrator for further assistance with SNMP.

SNMPDumpMIB

SNMPExtendedTraps

Controls Extended SNMP map functioning such as device transition and device error. Consult your network administrator for further assistance with SNMP.

set SNMPExtendedTraps [enabled|disabled]

get SNMPExtendedTraps

SNMPTrapAddress

Sets/displays the IP trap addresses and levels. Consult your network administrator for further assistance with SNMP.

Index: value between 1 and 6

IP Address: standard IP address

Trap Level: severity required for an event to trigger trap

None: no traps are sent to the address

ALL: all triggering events are sent

Warning: warning and critical events are sent

Critical: only critical events trigger a trap

set SNMPTrapAddress [Index] [IPAddress]

[none | all | warning | critical]

get SNMPTrapAddress

SNMPTraps

Enables/disables SNMP trap functions. Consult your network administrator for further assistance with SNMP.

Default: disabled

set SNMPTraps [enabled | disabled]

get SNMPTraps

TailEventLog

Displays new events to the terminal during a serial or Telnet session. Press <ESC> to exit tail mode.

TailEventLog

Temperature

Returns the current internal temperature in degrees Celsius.

get Temperature

TraceLog

When enabled, records various aspects of traffic the iPBridge receives to the trace log.

Default: disabled

set TraceLog [enabled|disabled]

get TraceLog

TraceLogFilter

*Filters the display of data for specific ports using the **DumpTraceLog** command when trace logging is enabled. If **all** is set for a particular port, all information about that port is captured when the command **DisplayTraceLog** is issued. If **disabled** is set for a port, no trace log entries for the port are captured.*

set TraceLogFilter [SCSI | all] [sb | all] [disabled | chkcond | all]

get TraceLogFilter [SCSI | all] [sb | all]

Voltage

Displays the current level of voltages monitored by the iPBridge.

VCC: +5.03 V

VDDA: +3.31 V

VDDB: +2.49 V

VDDC: +1.5V

VDDD: +1.35V

ALL: all monitored voltages

get Voltage <VCC | VDDA | VDDB | VDDC | VDDD | ALL>

WrapEventLog

When enabled, the iPBridge logs up to 2,048 event entries before wrapping (overwriting the first entries). If disabled, the iPBridge stops logging event entries when the buffer is full.

Default: enabled

set WrapEventLog [enabled|disabled]

Requires a SaveConfiguration command

get WrapEventLog

WrapTraceLog

When enabled, the iPBridge logs up to 2,048 trace entries before wrapping (overwriting the first entries). If disabled, the iPBridge stops logging trace entries when the buffer is full.

Default: enabled

set WrapTraceLog [enabled|disabled]

Requires a SaveConfiguration command

get WrapTraceLog

7.1.4 Maintenance commands

The CLI commands outlined in this chapter may be used to get information or perform functions which are used in a variety of situations with the ATTO iPBridge.

Date

Sets the date for the iPBridge if SNTP has been disabled or is not available.

set Date [MM] / [DD] / [YYYY]

Requires a SaveConfiguration command

get Date

FirmwareRestart

Causes the iPBridge to reboot, then re-initialize its firmware.

FirmwareRestart

MaxOpTemp

Establishes/reports the maximum enclosure temperature alarm in degrees Celsius. If the temperature of the iPBridge rises above the maximum MaxOpTemp, thermal control event handling occurs.

Valid entries are between 55 and 70 degrees C

Default: 70

set MaxOpTemp [55-70]

Requires a SaveConfiguration command

get MaxOpTemp

MinOpTemp

Establishes/reports the minimum enclosure temperature alarm in degrees Celsius. If the temperature of the iPBridge falls below the minimum MinOpTemp, thermal control event handling occurs. Valid entries are between 0 and 15 degrees

Default: 0

set MinOpTemp [0-15]

Requires a SaveConfiguration command

get MinOpTemp

OpTempWarn

Controls the number of degrees in Celsius before a thermal control event handling occurs. Warnings are made via system log entries. Valid entries are between 0 and 15 degrees

Default: 5

set OpTempWarn [0-15]

Requires a SaveConfiguration command

get OpTempWarn

Password

RestoreConfiguration default sets the password to the default value

Passwords are case sensitive, 1-32 characters with no spaces

When the password is all 0s, TCP/IP and ftp do not validate the password and MD5 authentication are disabled.

Default: Password

set Password

Requires a SaveConfiguration command

Reserve

Reservation of the iPBridge is implicit: once the configuration image is changed by any user of services, the iPBridge becomes RESERVED. Executing a SaveConfiguration or\ Restore configuration RELEASES the iPBridge so that other services users may access it. When iPBridge services interface is RESERVED, set commands from other users are unavailable.

At least one interface must always have access to the iPBridge.

Reserve

RestoreConfiguration

Restores configuration to either the default configuration or the configuration last saved into non-volatile memory. The saved option undoes any changes made since the last save.

RestoreConfiguration [Default | Saved]

SCSIPortReset

Resets the specified SCSI bus.

SCSIPortReset [sb]

SNTP

Controls the SNTP (Simple Network Time Protocol) settings for the iPBridge. When enabled, the iPBridge tries to contact a specified SNTP server at reset and every 12 hours after to initialize/synchronize the time.

Default: Enabled

set SNTP [enabled|disabled]

Requires a SaveConfiguration command

get SNTP

SNTPServer

Controls the IP address of the SNTP time server that the iPBridge contacts to initialize/synchronize the time.

If the iPBridge is unable to contact the specified SNTP server within 30 seconds, the iPBridge tries to contact the first auxiliary SNTP time server. If the first auxiliary SNTP time server is not available, the iPBridge tries to contact the second auxiliary SNTP time server. If the second auxiliary SNTP time server is not available, the iPBridge continues to approximate the time based on the most recent SNTP time server, physical real time clock or manual initialization/synchronization.

Alternative auxiliary time servers

129.6.15.28 (www.time-a.nist.gov)

132.163.4.101 (www.time-a-timefreq.bldrdoc.gov)

Default: 192.43.244.18 (www.time.nist.gov)

set SNTPServer [xxx.xxx.xxx.xxx]

Requires a SaveConfiguration command

get SNTPServer

SpeedWrite

When enabled, improves the performance of FCP WRITE commands to SCSI devices attached to the iPBridge.

Specify SCSI bus (sb), target (st), LUN (sl) of a mapped SCSI device or (all) for each currently mapped device.

set SpeedWrite scsi [sb st sl | all] [enabled | disabled]

get SpeedWrite scsi [sb st sl | all]

SpeedWriteDefault

When enabled, SpeedWrite performance enhancement is set as the default for any subsequent SCSI devices mapped manually or via an AutoMap operation. If disabled, the iPBridge does not attempt SpeedWrite performance enhancement to newly-mapped SCSI devices.

set SpeedWriteDefault [enabled | disabled]

get SpeedWriteDefault

Time

Controls the time for the iPBridge if SNTP has been disabled or is not available.

set Time [HH]: [MM]: [SS]

Requires a SaveConfiguration command

get Time

TimeZone

Controls the time zone for the iPBridge if SNTP has been disabled or is not available. Choices are EST, CST, MST, PST or numerical offset from GMT in the form of +/-:HH:MM. When SNTP is enabled, the iPBridge applies the time zone setting to the time retrieved from a specified SNTP time server to determine local time.

Default: EST

set TimeZone [[EST | CST | MST | PST] [+ / - HH :MM]]

Requires a SaveConfiguration command

get TimeZone

Username

Specifies user name for all TCP/IP, FTP and ExpressNAV web server sessions. The user name is case insensitive, 1-32 characters, no spaces. Changes to the Admin Level Username requires an Admin Level password.

Default: root

set Username

Requires a SaveConfiguration command

get Username

7.1.5 Serial port configuration commands

The ATTO iPBridge serial ports or serial headers are configured with default settings but may be customized to your specifications using the CLI commands in this section.

SerialPortBaudRate

Configures/reports the baud rate for the iPBridge RS-232 serial port or serial header. The number of data bits per character is fixed at 8 with no parity. Choices are 9600, 19200, 38400, 57600 and 115200.

Default: 115200

set SerialPortBaudRate [9600 | 19200 | 38400 | 57600 | 115200]

Requires a SaveConfiguration command

get SerialPortBaudRate

SerialPortEcho

Enables/disables/reports the echoing of keyboard input. When enabled, all non-control character keyboard input is output to the display. Local ASCII terminal (or terminal emulator) echo settings should be set to disabled while using SerialPortEcho enabled

Default: enabled

set SerialPortEcho [enabled | disabled]

Requires a SaveConfiguration Restart command

get SerialPortEcho

7.1.6 Ethernet commands

These commands configure the management and data Ethernet ports including TCP/IP parameters.

DPMTU

Controls the MTU (Maximum Transmission Unit) used by the Ethernet ports: Increasing the MTU may improve throughput.

Default: 1514

set DPMTU [DPn] | mp1] [1514 | 9014]

Requires a SaveConfiguration command

get DPMTU

EthernetSpeed

Specifies the speed of the Ethernet ports. If auto is enabled, the speed is negotiated. Speeds 10 and 100 are half duplex 10 base T is only valid for the management port. Choices are:

10 = 10 baseT

100 = 100 baseT

1000 =1000baseT

Default: auto

set EthernetSpeed [DPn] | mp1] [10 | 100 | 1000 | Auto]

Requires a SaveConfiguration command

get EthernetSpeed [DPn] | mp1] all]

Exit

Exits the current TCP/IP CLI session; it has no effect if used during a serial CLI session.

Exit

IPAddress

*Controls the IP address of the iPBridge Ethernet data ports. If IPDHCP is enabled, the **get** command reports the current IP address assigned by the network DHCP server; followed by the DHCP identifier.*

Default IP addresses:

dp1= [10.0.0.1]

dp2= [10.0.0.2]

dp3= [10.0.0.3]

dp4= [10.0.0.4]

mp1=[10.0.0.5]

set IPAddress [DPn] | mp1] xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

get IPAddress [DPn] | mp1] all]

IPDHCP

Selecting DHCP allows the iPBridge to request an IP address from the network DHCP server. The network must have at least one DHCP server

Default: enabled

set IPDHCP [DPn] | mp1] all]] [enabled | disabled]

Requires a SaveConfiguration command

get IPDHCP [DPn] | mp1] all]

IPGateway

*Controls the current gateway. If IPDHCP is enabled (see above), **get** command reports the current IP gateway assigned by the network DHCP server*

Default: 0.0.0.0

set IPGateway [DPn] | mp1] all] xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

get IPGateway [DPn] | mp1] all]

IPSubnetMask

*Controls the current subnet mask. If IPDHCP is enabled (see above), **get** command reports the current subnet mask assigned by the DHCP server*

Default: 255.255.0.0

set IPSubnetMask [DPn] | mp1] all] xxx.xxx.xxx.xxx

Requires a SaveConfiguration command

get IPSubnetMask [DPn] | mp1] all]

Password

Specifies a password for all sessions: TCP/IP, FTP and ExpressNAV web-based interface. You are prompted for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command

RestoreConfiguration default sets the password to its default value.

Default: Password

set Password

Requires a SaveConfiguration command

Ping

Ping sends an ICMP echo request to the specified host.

ping [DPn] | mp1] [xxx.xxx.xxx.xxx] <count <size>>

ReadOnlyPassword

Specifies a read only password for all sessions: TCP/IP, FTP and ExpressNAV web-based interface. You are prompted for the current password, to enter the new password, and to confirm the new password. Passwords are case sensitive, 0-32 characters with no spaces. An empty password can be configured by entering the Password confirmation prompts with no parameters. The command **RestoreConfiguration default** sets the password to its default value.

Default: Password

set ReadOnlyPassword

Requires a SaveConfiguration command

ReadOnlyUsername

Specifies a read only user name for all TCP/IP, FTP and ExpressNAV web server sessions. User name is case insensitive, 1-32 characters with no spaces.

Default: user

set ReadOnlyUsername

Requires a SaveConfiguration command

get Username

RMON

Collects and stores Ethernet data on data ports at specified intervals.

Refer to <http://tools.ietf.org/html/rfc2819>

You can display the entire table requested, or a single entry based on the index (and sample index for the Ethernet History table). Setting the history control entries takes effect immediately, but changes must be saved to be persistent over a reboot.

Default: See Exhibit 7.1-7 on page 48.

get RMON [ethernetStat | historyControl] <idx>

Valid range for ethernetStat: 1-3

Valid range for historyControl: 1-6

Lists the contents of either the Ethernet Statistics table (statistics measured by the probe for each monitored Ethernet interface on the device) of the History Control table (periodic statistical sampling of data from various

types of networks). If **idx** is not specified, the entire table is listed.

get RMON [ethernetHistory] <idx sampleIdx>

Valid range for ethernetHistory idx: 1-6

Valid range for ethernetHistory sampleIdx: 1-180

Lists the contents of the Ethernet History table (a collection of periodic statistical examples from an Ethernet network). If **idx sampleIdx** is not specified, the entire table is listed. Entries in the Ethernet History table are not valid when the Sample Index is **0**.

set RMON [idx] [bucketsRequest] [interval] [valid | invalid]

Valid range for bucketsRequest: 1-180

Valid range for interval: 1-3600

Sets values in the History Control table to control the sampling period (interval is specified in seconds). Can also be used to set entries in the History Control table to valid or invalid.

Username

Specifies a user name for all TCP/IP, FTP and ExpressNAV web server sessions. Username is case insensitive, 1-32 characters with no spaces. Changes to the Admin Level user name requires an Admin Level password.

Default: root

set Username

Requires entering a password

Requires a SaveConfiguration command

get Username

VLAN

Creates up to eight Virtual LAN IDs for each Ethernet data port. Each VLAN ID is assigned a VLAN name of up to 64 characters. If no VLAN ID exists for a data port, VLAN is disabled for that port. Refer to [Set up a VLAN: Virtual Local Area Network on page 14](#)

set VLAN [dp [n]] [[VLAN ID] [VLAN Name] <delete>] [all] [delete]]

Requires a SaveConfiguration command

get VLAN [dp[n]]

Exhibit 7.1-7 RMON command: default history Control table (buckets and interval in hexadecimal).

Idx	DataSrc	BktReq	BktGrant	Interval	Owner	Status
001	43.6.1.2.1.2.2.1.1.1	00000032	00000032	0000001e	monitor	00000004
002	43.6.1.2.1.2.2.1.1.1	00000032	00000032	00000708	monitor	00000004
003	43.6.1.2.1.2.2.1.1.2	00000032	00000032	0000001e	monitor	00000004
004	43.6.1.2.1.2.2.1.1.2	00000032	00000032	00000708	monitor	00000004
005	43.6.1.2.1.2.2.1.1.3	00000032	00000032	0000001e	monitor	00000004
006	43.6.1.2.1.2.2.1.1.3	00000032	00000032	00000708	monitor	00000004

7.1.8 SCSI configuration commands

The SCSI ports are configured with default settings but may be customized to your specifications using the CLI commands in this section.

SCSIDomainValidation

Runs Domain Validation tests on the SCSI system which may detect problems with SCSI cables, termination or damaged ransceivers. Tape drives attached to the FstStream should be loaded with mdia. The media is not overwritten. Disable [VirtualDriveResponse](#) before running this test and reboot the iPBridge after running the test.

SCSIDomainValidation

SCSIInitID

Specifies the SCSI initiator ID to be used on the specified SCSI port. All maps coinciding with the user-specified SCSIInitID must be set to offline and becomes invalid upon issuing this command. Choices are 0 to 15.

Default: 7

set SCSIInitID [sb [0-15]]

Requires a SaveConfiguration command

get SCSIInitID

SCSIPortBusSpeed

Controls the transfer rate at which the iPBridge tries to negotiate with its SCSI devices.

Default: Ultra3

set SCSIPortBusSpeed [sb [fast | ultra | ultra2 | ultra3]

Requires a SaveConfiguration command

get SCSIPortBusSpeed [PortNum]

SCSIPortList

*Returns a list of available SCSI ports and their current status. Valid status values are **O.K.** and **Failed**.*

SCSIPortList

SCSIPortReset

Resets the specified SCSI bus.

SCSIPortReset [sb]

SCSIPortResetOnStartup

Specifies whether the SCSI port should be reset on power-up or not.

Default: enabled

set SCSIPortResetOnStartup [sb [enabled | disabled]]

Requires a SaveConfiguration command

get SCSIPortResetOnStartup [sb]

SCSIPortSyncTransfer

Specifies whether synchronous SCSI transfers should be negotiated with devices on the specified SCSI port.

Default: enabled

set SCSIPortSyncTransfer [[sb [enabled | disabled]]

Requires a SaveConfiguration command

get SCSIPortSyncTransfer [sb]

SCSIPortTermination

Configures/reports the SCSI internal termination of the SCSI port identified.

Default: enabled

set SCSIPortTermination [sb [enabled | disabled]]

Requires a SaveConfiguration command

get SCSIPortTermination [sb]

SCSIPortWideTransfer

Specifies whether wide SCSI transfers should be negotiated.

Default: enabled

set SCSIPortWideTransfer [sb [enabled | disabled]]

Requires a SaveConfiguration command

get SCSIPortWideTransfer [sb]

SCSITargetLUNs

Controls the maximum number of SCSI LUNs per target the unit queries during a SCSI bus scan.

Default: 8

set SCSITargetLUNs [sb] [8 | 32]

get SCSITargetLUNs [sb]

SCSITargets

Returns a list of SCSI devices operational on the referenced SCSI port. Also updates the current logical to physical address mapping configuration by updating the status of any online maps/routes to unavailable if a device is not found or to online if a device is found at the respective SCSI address.

SCSITargets [sb]

SpeedWrite

When enabled, improves the performance of WRITE commands to SCSI devices attached to the iPBridge. Specify SCSI bus (sb), target (st), LUN (sl) of a mapped SCSI device or (all) for each currently mapped device

set SpeedWrite scsi [sb st sl | all] [enabled | disabled]
get SpeedWrite scsi [sb st sl | all]

SpeedWriteDefault

When enabled, SpeedWrite performance enhancement is set as the default for any subsequent SCSI devices mapped manually or via an AutoMap operation. If disabled, the iPBridge does not attempt SpeedWrite performance enhancement to newly-mapped SCSI devices.

Default: disabled

set SpeedWriteDefault [enabled | disabled]

get SpeedWriteDefault

VirtualDriveResponse

Allows the iPBridge to provide proxy responses to SCSI INQUIRY and TEST UNIT READY commands if a SCSI device selection times out or is busy. Host systems can then assign devices consistently regardless of the device's state during the execution of the commands.

Default: disabled

set VirtualDriveResponse [enabled | disabled]

get VirtualDriveResponse

7.1.9 iSCSI commands

Default settings may be customized to your specifications using the CLI commands in this section.

iSCSIAlias

Provides a human-readable name assigned to the iPBridge. Aliases may be 1 to 64 characters long and may contain spaces if spaces are enclosed in quotation marks. Entering the **set iSCSIAlias** command with no alias parameter causes the alias to be removed.

Default: ""

set iSCSIAlias [Alias]

Requires a SaveConfiguration command

get iSCSIAlias

iSCSICHAP

Controls whether CHAP (Challenge Handshake Authentication Protocol) is used for iSCSI protocol. If CHAP is enabled, the target requires the initiator to negotiate CHAP authentication using the CHAP secrets. An initiator may reject this negotiation. If **discovery** is specified, the setting applies to CHAP during discovery sessions.

set iSCSICHAP [default|Target Name| discovery]
[enabled | disabled]

get iSCSICHAP [default|Target Name|discovery]

iSCSIChapSecret

Specifies the incoming and outgoing passwords for iSCSI chap sessions. Secrets are case sensitive, 12 to 32 characters (16 for Microsoft iSCSI initiator), and cannot contain spaces. **In** and **out** secrets must be different. If 'discovery' is specified, the setting applies to CHAP during discovery sessions.

An in secret is for authentication of the server to the bridge. The bridge can store up to 32 'in' secrets, each with a unique Account Name and secret pair.

An out secret is for authentication of the bridge to the server. There is only one 'out' secret per target that cannot be deleted. The account name for the out secret is 'root' by default.

The account name is ignored for out secrets and defaults to **root**.

set iSCSICHAPSecret [default | target name | discovery]
[in [Account Name | all] | out [root] | delete [Account
Name | all]] <Secret>

get iSCSICHAPSecret [default | target name | discovery]
[in [Account Name | all] | out [root]]

iSCSIInitiators

Displays a list of previous and current successfully logged-in iSCSI initiators. This list comes from the successful initiators recorded in the event log and any initiators that were manually added since the last reboot. This list is cleared if the event log is cleared.

iSCSIInitiators

iSCSIPortNumber

Specifies the port number whereby the iPBridge listens for iSCSI connections. The port number must be between 1024 and 65535 except for port 860.

Default: 3260

set iSCSIPortNumber [dp[n] | all] [portnumber]

Requires a SaveConfiguration command

get iSCSIPortNumber [dp[n]] | all]

iSCSITarget

Creates/deletes an iSCSI target name. The target name acts as a suffix to the standard bridge iSCSI-qualified name. The target name may not exceed 24 characters. A newly-created target has one LUN, the iPBridge LUN, at LUN 0. If the target name already exists, this command does nothing. In verbose mode, overwriting a map requires secondary confirmation of the action.

iSCSITarget [Target Name] <delete>

iSCSITargetNameDisplay

Displays the iSCSI target name.

iSCSITargetNameDisplay

iSCSIWANIPAddress

Sets the IP address reported from the host. Setting the address to 0.0.0.0 causes the unit to report the LAN IP address.

Default: 0.0.0.0

set iSCSIWANIPAddress [dp[n] | all] [xxx.xxx.xxx.xxx]

get iSCSIWANIPAddress [dp[n] | all]

iSNSLoginControl

Specifies whether the iPBridge delegates its access control/authorization to an iSNS server.



Note

iSNSLoginControl cannot be used with AccessControl

Default: disabled

set iSNSLoginControl [enabled | disabled]

Requires a SaveConfiguration command

get iSNSLoginControl

iSNSServer

Specifies whether the IP address of a valid iSNS server from which the iPBridge attempts iSCSI initiator discovery. Setting to 0.0.0.0 disables iSNS server lookup.

Default: 0.0.0.0

set iSNSServer [xxx.xxx.xxx.xxx]

Requires a SaveConfiguration command

get iSNSServer

7.1.10 Mapping commands

You may map devices via the web-based server or through the management or serial ports.



Note

The recommended management tool for the iPBridge is ATTO ExpressNAV.

AccessControl

Controls access to a target node as keyed to the iSCSI qualified name of whitelisted initiators.



Note

AccessControl cannot be used with iSNS

set AccessControl [default | Target Name] [enabled | disabled]
get AccessControl [default | Target Name]

AccessEntry

*Allows the addition or deletion of an initiator entry from the access control list of a target node. The initiator name must be an iSCSI qualified name and must be between 1 to 223 character. The name is case sensitive and cannot be **all**.*

set AccessEntry [default | Target Name | discovery] [Initiator Name <delete> | all [delete]]
get AccessEntry [default | Target Name | discovery]

AutoMap

Automatically assigns iSCSI LUNs to a set of target destination devices visible to the iPBridge. Automap with no arguments maps all drives to the default target. By specifying a target name, Automap maps all devices to that target. By specifying “”, automap maps each device to its own auto-named target.*

AutoMap <default |Target Name *>

AutoMapOnBoot

Controls automatic device detection and mapping (automap) at bridge startup.

Default: enabled

set AutoMapOnBoot [enabled | disabled]

Requires a SaveConfiguration command

get AutoMapOnBoot

DeleteAllMaps

Removes all mapped devices from the map table. If you do not create other mapping before the next firmware restart, the default mapping is used.

DeleteAllMaps

iSCSITarget

Creates/deletes an iSCSI target name. The target name acts as a suffix to the standard bridge iSCSI-qualified name. The target name may not exceed 24 characters. A newly-created target has one LUN, the iPBridge LUN, at LUN 0. If the target name already exists, this command does nothing. In verbose mode, overwriting a map requires secondary confirmation of the action.

iSCSITarget [Target Name] <delete>

iSCSITargetNameDisplay

Displays the iSCSI target name.

iSCSITargetNameDisplay

Route

Assigns a host protocol address to a target destination device.

Route iSCSI [default | target name] [lun] [SCSI <bb tt ll> | Bridge | Delete]

RouteDisplay

Displays a combined list of host protocol addresses to target destination device mappings.

RouteDisplay iSCSI [default <lun>|Target Name <lun>]

Appendix A ATTO Bridge family

The ATTO bridge family of products provides GbE-to-SCSI or Fibre Channel-to-SCSI bridges available as Compact PCI (CPCI) boards, stand alone enclosures that can be fitted for rackmount integration, or desktop units, depending on the model and your needs.

The ATTO iPBridge and ATTO FibreBridge family of products share common configuration options and functions to provide the most versatile connectivity options available. Each product has been engineered to address specific customer needs. New capabilities are integrated into products throughout the family as much as possible, requiring only an upgrade of firmware to incorporate them into your SAN (Storage Area Network) or NAS (Network Attached Storage). Check the website, www.attotech.com, for the latest firmware updates.

IPBridge products

Product features	2700	2600R/D	2500	1550	1500
Number of GigE ports	4	4	3	1	1
Number of SCSI ports		2	2	1	1
SCSI interface		LVD/SE	LVD/SE	LVD	LVD
Number of FC ports	2				
FC interface	SFP				
Data transfers	4 Gigabit				
Ethernet interface	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet	Gigabit Ethernet
Data transfer	wire speed	wire speed	near wire speed	wire speed	37 MB/sec.
Configuration	cPCI board Desktop Rack	cPCI board Desktop Rack	cPCI board Desktop Rack	Embedded Desktop	Embedded Desktop
Supports					
• full duplex data transfers	Yes				
• Class 3 transfers	Yes				
• intermix transfers	Yes				
• direct fabric connect	Yes				
• error recovery	Yes				
Bridge management available					
• Serial	Yes	Yes	Yes	Yes	Yes
• Ethernet	Yes	Yes	Yes	Yes	Yes
• In-band	Yes				
Diagnostics	Advanced	Advanced	Standard	Advanced	Standard
Common Code base			Yes	Yes	Yes
Virtual Device Architecture	Yes	Yes		Yes	
ExpressNAV web management	Yes	Yes	Yes	Yes	Yes
iSCSI SANS	Yes	Yes	Yes	Yes	Yes
Configuration save and restore	Yes	Yes		Yes	
Access Control Lists (ACL)	Yes	Yes			
VLAN support	Yes	Yes			
RoHS Compliance	Yes	Yes		Yes	

FibreBridge products

Product features	1290E	2300	2350	2390	2400
Number of FC ports	1	1	1	1	2
FC interface	SFP	SFP	SFP	SFP	SFP
Data transfers	2-Gb	2-Gb	2-Gb	4-Gb	4-Gb
Number of SCSI ports	2	2	2	2	2
SCSI interface	LVD/SE	LVD/SE	LVD/SE	LVD/SE	LVD/SE
Sustained data transfer rate (MB/sec.)	160	185	195	280	440
Configurations	Embedded	cPCI board, rackmount desktop	cPCI board, rackmount desktop	cPCI board, rackmount desktop	cPCI board, rackmount desktop
Full duplex data transfers	Yes	Yes	Yes	Yes	Yes
Supports					
• Class 2 transfers	Yes	Yes	Yes		
• Class 3 transfers	Yes	Yes	Yes	Yes	Yes
• intermix transfers	Yes	Yes	Yes		
• direct fabric connect	Yes	Yes	Yes	Yes	Yes
• error recovery	Yes	Yes	Yes	Yes	Yes
Bridge management available					
• Serial	Yes	Yes	Yes	Yes	Yes
• Ethernet	Yes	Yes	Yes	Yes	Yes
• In-band	Yes	Yes	Yes	Yes	Yes
Serverless backup	Yes	Yes	Yes	Future	Future
Virtual Device Architecture (VDA)				Yes	Yes
Port failover					Yes
Diagnostics	Standard	Standard	Advanced	Advanced	Advanced
Configuration save and restore				Yes	Yes
ExpressNAV web management	Yes	Yes	Yes	Yes	Yes
RoHS compliance				Yes	Yes

Appendix B Cabling

Additional information to physically connect ports to devices and to your SAN.

SCSI cabling

Cables and devices must be chosen to maximize performance and minimize the electrical noise from the high-speed data transfers available with the SCSI protocol. Cabling and termination methods become important considerations for proper performance. SCSI cables and devices are subject to specific length and number limitations to deal with electrical problems that arise at increased operating speeds.

Cable types

Use high-quality cables rated for the type of SCSI transfers required: well-insulated SCSI cables ensure error free communications. Try to keep cable lengths as short as possible to ensure higher signal quality and performance.

Examples

The SCSI specification limits total bus cable length for single-ended SCSI in a non-UltraSCSI environment to 3 meters (combined length of both internal and external cable lengths).

In an UltraSCSI workgroup environment with a 7-drive tower, you are limited to 1.5 meters between the host and the tower, including the cabling for the tower. If the 7-drive tower requires 1 meter of cabling to connect all of its drives, the distance from the tower to the host must be .5 meters.



Note

UltraSCSI is very sensitive to SCSI bus noise, cable distances and the number of devices connected on the SCSI bus. Carefully connect your devices when working with UltraSCSI.

Exhibit 0.0-1 Various types of SCSI operate at different speeds and require different bus lengths to support a certain number of devices.

STA terms	Bus speed MB/sec. max.	Bus width bits	Max. bus lengths in meters			Max. device support
			Single- ended	Differential	LVD	
Fast SCSI	10	8	3	25	n/a	8
Fast/WIDE SCSI	20	16	3	25	n/a	16
UltraSCSI	20	8	1.5	25	n/a	8
Ultra/WIDE SCSI	40	16	n/a	25	n/a	16
WIDE Ultra SCSI	40	16	1.5	n/a	n/a	8
WIDE Ultra SCSI	40	16	3	n/a	n/a	4
Ultra2 SCSI	40	8	n/a	n/a	12	8
WIDE Ultra2 SCSI	80	16	n/a	n/a	12	16
Ultra 160 SCSI	160	16	n/a	n/a	12	16
Ultra 320 SCSI	320	16	n/a	12	n/a	16

Connecting SCSI devices to SCSI ports

ATTO iPBridge SCSI ports connect SCSI storage devices to the network. Each SCSI port is completely independent from the other SCSI port. Each SCSI port is a bus capable of supporting 15 devices and each bus is capable of 40, 80, 160 or

520 MB/sec. (Ultra, Ultra2, Ultra 160 or Ultra 320) transfer rates.

You may use externally provided striping software to create a RAID 0 group that includes devices from both SCSI busses to increase overall performance.

Each SCSI bus auto-negotiates the appropriate sync rates with the connected devices. If slower devices are mixed with faster devices, the bus communicates at the rate of the slowest device, thus wasting the performance capabilities of the faster devices. Connect slower devices to one SCSI port and connect faster devices to the other port.

The iPBridge supports a wide variety of SCSI storage devices including stand-alone drives, removable drives, JBODs, RAIDs, tape, CD and DVD drives, changers and libraries.

- 1 Connect the cable from the SCSI device to a VHDCI SCSI port on the iPBridge.
- 2 Check the type of cable, cable length limit and number of devices recommended for the port. See Exhibit 0.0-1.

Keep cable lengths as short as possible to ensure the highest signal quality and performance. These cable lengths include the wiring inside the devices.

- 3 Set the IDs of the SCSI devices connected to the bridge to a value other than 7.

Use a sequential ID starting at 0 for each device. The SCSI port in the ATTO iPBridge has an internal factory setting ID of 7, typical for a SCSI initiator device.



Note

The entire SCSI bus operates at the speed of the slowest device on that bus. If you wish to mix devices of different SCSI speeds, place the devices on separate busses. That is, put the slower devices on iPBridge 2500 SCSI bus 0, and the faster devices on iPBridge 2500 SCSI bus 1. Each bus is independent so each can operate at different speeds.

Terminate the SCSI bus after the last device. The iPBridge is terminated internally.

Ethernet connections

Use at least Cat 5e cable to connect the Ethernet ports to your network.



Note

For best performance, all cabling, network interface cards (NICs), host bus adapters (HBAs), and network switches must be Gigabit Ethernet (GbE), and at least Cat 5e certified. Most standard offices use 2-pair wiring which is not compatible. GbE requires 4-pair wiring.

For best performance, support for 9014 byte jumbo frames should be available for all switches and host iSCSI equipment.

Before you begin installing the iPBridge Ethernet ports, be sure to check or complete the following:

- If you are managing your iSCSI system across a WAN and your system uses a firewall, be sure that the following ports are open and available:

If you are using the TCP protocol

- telnet (port 23)
- http (port 80)
- ftp (ports 20 and 21)
- iSCSI (port 3260)

- iSNS (port 3705)

If you are using the UDP protocol

- ntp (port 123)

- Be sure your host system(s) is set up and configured.
 - Your host system can use any of three different types of cards: a network interface card (NIC), a TCP/IP offload engine card (TOE), or a storage network interface card (SNIC).
 - The ATTO driver file from the CD included with your iPBridge or from the ATTO website, www.attotech.com, is installed on your host.
 - The switch has been configured to forward UDP broadcast messages.
- The minimum requirement for Windows-based browsers is Internet Explorer 5.5 or Netscape Navigator 6.2. The minimum requirement for Macintosh browsers is Internet Explorer 5.2 or Safari 1.2.
- Ethernet speed defaults to auto; the iPBridge determines the speed and set other parameters based on the speed.

Appendix C Glossary

More information is available through the Storage Networking Industry Association (www.snia.org/education/dictionary) and the IETF (www.ietf.org).

Term	Definition
Access Control List (ACL)	Access Control List: characteristic of an iSCSI target node on ATTO iPBridges whereby iSCSI initiators allowed access to that target node are included on a list of permitted initiators.
Broadcast Domain	PCs and servers send (broadcast) information out through an Ethernet domain. Switches and routers may connect domains, but may not share information across domains.
CHAP	Challenge-Handshake Authentication Protocol: If CHAP is enabled, the target requires the initiator to negotiate CHAP authentication using the CHAP secrets (passwords). An initiator may reject this negotiation.
DHCP	As defined in RFC 2131, a protocol which assigns IP addresses to devices on a local area network. The iPBridge is set up by default to request an IP address from the DHCP server.
Firmware	Software stored in read-only memory (ROM) or programmable ROM (PROM); firmware is often responsible for the behavior of a system when it is first switched on
IETF	Internet Engineering Task Force: The standards body responsible for Internet standards such as SNMP and TCP/IP through a community of network designers, operators, vendors and researchers concerned with the evolution and smooth operation of the Internet
Initiator Device	A component which originates a command
iSCSI	Internet SCSI (Small Computer System Interface), a protocol to link data storage facilities over the Internet or an intranet developed by the Internet Engineering Task Force (IETF); carries SCSI commands over IP networks to facilitate data transfers over intranets and manage storage over long distances
iSCSI node	representation of a single iSCSI initiator or iSCSI target. Each iSCSI target node accessed through the Ethernet port on an iPBridge is identified by a unique world-wide iSCSI-qualified name.
LUN	Logical Unit Number: an identifier of a device
NAS	Network Attached Storage: storage elements connected to a network to provide file access services to computer systems; an NAS Storage Element includes an engine to implement the file services and one or more devices to store data; NAS elements may be attached to any type of network; an NAS host system uses a file system device driver to access data and NAS systems interpret these commands to execute the necessary internal file and device I/O operations
SCSI	Small Computer Systems Interface: a processor-independent standard for system-level interface between a computer and intelligent devices including hard disks, tape, floppy disks, CD-ROM, printers, scanners, etc.
SNMP	Simple Network Management Protocol: a standard for monitoring and managing systems and devices in a network; data is defined by a MIB; functions supported include the request and retrieval of data
SNTP	Simple Network Time Protocol: uses a server to set the time and date over the Ethernet port.
Target Node	iSCSI synonym for zone

Appendix D Safety standards and compliances

The equipment described in this manual generates and uses radio frequency energy. If this equipment is not used in strict accordance with the manufacturer's instruction, it can and may cause interference with radio and television reception. Refer to the Technical Specification sheet available at www.attotech.com for a full list of certifications.



WARNING

Risk of explosion if battery is removed and/or replaced by an incorrect type. Dispose of used batteries in accordance with your local environmental regulations.

No operator serviceable components inside the iPBridge.

Do not remove cover of iPBridge. Refer servicing to qualified personnel.



FCC Standards: Radio and Television Interference



WARNING

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide a reasonable protection against such interference when operating in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, try to correct the interference by one or more of the following measures

- Move the receiving antenna.
- Relocate the bridge with respect to the receiver, or move the bridge away from the receiver.

The booklet *How to Identify and Resolve Radio/TV Interference Problems* prepared by the Federal Communications Commission is a helpful guide. It is available from the US Government printing office, Washington, DC 20402, Stock No. 004-000-00345-4.

- Plug the computer into a different outlet so the computer and receiver are on different branch circuits.
- If necessary, consult an ATTO authorized dealer, ATTO Technical Support Staff, or an experienced radio/television technician for additional suggestions.

Canadian Standards



This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.



European Standards

Declaration of Conformity

This following statement applies to the ATTO iPBridge.

This device has been tested in the basic operating configuration and found to be compliant with the following European Union standards

Application of Council Directive: 89/336/EEC

Standard(s) to which conformity is declared: EN55022, EN5024, CE60950

This Declaration will only be valid when this product is used in conjunction with other CE approved devices and when the entire system is tested to the applicable CE standards and found to be compliant.



The ATTO iPBridge 2600 complies with Directive 2002/95/EC on the Restriction of the Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS).

Appendix E ATTO accessories

The following accessories are available through ATTO Technology. Contact an ATTO Technology authorized sales representative to order.

iSCSI Bridge board-level models

ATTO iPBridge 2600C

IPBR-2600-CR0 4 Gigabit Ethernet by 2 LVD Ultra320 SCSI

ATTO iPBridge 2700C

IPBR-2700-CR0 4 Gigabit Ethernet by 2 4-Gb Fibre Channel

ATTO iPBridge 2500C

IPBR-2500-C00 3 Gigabit Ethernet by 2 LVD SCSI

ATTO iPBridge 1500E

IPBR-1500-E00 1 Gigabit Ethernet by 1 LVD SCSI, up to 37 MB/sec.

ATTO iPBridge 1550E

IPBR-1550-E00 1 Gigabit Ethernet by 1 LVD SCSI, up to 100 MB/sec.

iSCSI Bridge desktop models & desktop models with rackmount kits

ATTO iPBridge 2600R/D

IPBR-2600-DR0 4 Gigabit Ethernet by 2 LVD Ultra320 SCSI

ATTO iPBridge 2700R/D

IPBR-2700-DR0 4 Gigabit Ethernet by 2 Gb Fibre Channel

ATTO iPBridge 2500R/D

IPBR-2500-D00 3 Gigabit Ethernet by 2 LVD SCSI

ATTO iPBridge 1500D

IPBR-1500-D00 1 Gigabit Ethernet by 1 LVD SCSI 1, up to 37 MB/sec.

ATTO iPBridge 1550D

IPBR-1550-D00 1 Gigabit Ethernet by 1 LVD SCSI 1, up to 100 MB/sec.

Cables

CBL-HD68-681 SCSI, External, HD68 to HD68, U320-rated, 1m

CBL-LCLC-003 Fibre Channel, Optical, LC to LC, 3m.

CBL-LCLC-010 Fibre Channel, Optical, LC to LC, 10m.

CBL-LCSC-003 Fibre Channel, Optical, LC to SC, 3m.

CBL-LCSC-010 Fibre Channel, Optical, LC to SC, 10m.

Accessories

SFP2-0000-000 Adapter, 2-Gigabit Fibre Channel, Short Wave Optical, SFP LC

SFP4-0000-000 Adapter, 4-Gigabit Fibre Channel, Short Wave Optical, SFP LC

Cables: RS232

CBL-0911-001 Cable, Serial RS232, RJ11 to DB9, 10 ft.

Appendix F Warranty, contact information

Manufacturer limited warranty

Manufacturer warrants to the original purchaser of this product that it will be free from defects in material and workmanship as described in the ATTO Technology website, www.attotech.com. Manufacturer liability shall be limited to replacing or repairing, at its option, any defective product. There will be no charge for parts or labor should Manufacturer determine that this product is defective.

Products which have been subject to abuse, misuse, alteration, neglected, or have been serviced, repaired or installed by unauthorized personnel shall not be covered under this warranty provision. Damage resulting from incorrect connection or an inappropriate application of this product shall not be the responsibility of Manufacturer. Manufacturer's liability is limited to Manufacturer's product(s); damage to other equipment connected to Manufacturer's product(s) will be the customer's responsibility.

This warranty is made in lieu of any other warranty, express or implied. Manufacturer disclaims any implied warranties of merchantability or fitness for a particular purpose. Manufacturer's responsibility to repair or replace a defective product is the sole and exclusive

remedy provided to the customer for breach of this warranty. Manufacturer will not be liable for any indirect, special, incidental, or consequential damages irrespective of whether Manufacturer has advance notice of the possibility of such damages. No Manufacturer dealer, agent or employee is authorized to make any modification, extension or addition to this warranty.

Contact ATTO Technology, Inc.

Customer service, sales and technical support are available by phone Monday through Friday, 8 a.m. to 5 p.m EST., or by fax and web site 24-hours a day.

ATTO Technology, Inc.
155 CrossPoint Parkway
Amherst, New York 14068
(716) 691-1999 • voice
(716) 691-9353 • fax
<http://www.attotech.com>

ATTO Technology can also be reached via e-mail at the following addresses:

<i>Sales Support:</i>	sls@attotech.com
<i>Technical Support:</i>	techsupp@attotech.com